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THE CLASSIFICATION OF THE FAMILY DENDROCOLAPTIDÆ.

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PLATES XI–XII.

IN a paper just published in the 'Revista do Museu Paulista,' Vol. IX, 1914, I was able to show that the life histories of the birds composing the several subfamilies of Dendrocolaptidæ exhibit important differences well calculated to aid in the proper systematic arrangement of the various genera. More recently I have studied the craniological characters of the different genera and it is the purpose of the present paper to set forth the results of these studies.

I have already shown that biological conditions in the family Tyrannidæ furnished excellent indications of the proper systematic arrangement of the genera, and lately I have been able to complete my former work especially with regard to the genera *Onychorhynchus* and *Myiobius*. My investigations inspire my admiration for the accuracy of the systematic arrangement proposed by R. Ridgway who on morphological characters has already divided the genus *Myiobius* exactly in the same manner as my observations on the nidification of the species demand.

I am of the opinion that the family Dendrocolaptidæ of Sclater is also in need of further study and in this connection biological

observations furnish valuable hints on the systematic arrangement of the genera. According to their manner of life these birds form three natural groups. Those allied to *Furnarius* are inhabitants of the open country and low lands. They construct their nests in the ground with subterranean burrows leading to them, sometimes of considerable length. The custom of the Ovenbirds of constructing their nests in trees is evidently a secondary adaptation and the material employed in their construction — mud — indicates that their ancestors nested in the ground.

The second group contains the genus *Synallaxis* and related forms. They live like many other small birds upon trees and bushes and construct big dome-shaped nests, either of grass, moss and other soft materials or of sticks.

The birds of the last section comprising the Dendrocolaptinæ and part of the Philydorinæ, live in the forest like the woodpeckers and nest in holes in trees.

The eggs of all the members of the family are white or whitish green except in a few genera of Synallaxinæ in which they assume a uniform blue-green coloration.

If we compare the above facts with the classification given by Sclater in the 'Catalogue of Birds of the British Museum' we find a general correspondence and are inclined to adopt his subfamilies with some modification. The removal of the genus *Anumbius* from the Synallaxinæ cannot be approved. The Philydorinæ with the exception of a few genera approach the Dendrocolaptinæ but are easily distinguished by morphological characters.

Radically opposed to our views, however, is the classification adopted by Ridgway in his admirable work 'The Birds of North and Middle America,' Vol. V, where the birds under consideration are distributed in two distinct families,— Furnariidæ and Dendrocolaptidæ. The reason for distinguishing two families is stated to rest chiefly on differences in the structure of the skull. I have studied the skulls of a great number of genera and shall explain the results of my researches.

In accordance with Garrod, Beddard and other authors, Ridgway places the genera with a holorhinal skull in the family Dendrocolaptidæ, and those with a schizorhinal skull in the Furnariidæ. In the latter group the osseous nostril reaches the posterior end of

the premaxilla or passes above it, but does not extend to this point in the holorhinal skull. It must however be observed that the term schizorhinal cannot properly be applied to the members of the Furnariidæ because the posterior end of the nostril does not end in a gap but has always a rounded extremity. For this very reason Fürbringer rejects the term schizorhinal in this connection, substituting for it the new term pseudo-schizorhinal, and adds that both terms probably only refer to different modifications of the same anatomical condition.

We shall see this opinion amply confirmed by my studies.

The Synallaxinæ are without exception schizorhinal as are also the Furnariinæ, although *Geobates* has the nasal foramen somewhat shortened, its posterior end being situated somewhat before that of the intermaxillary.

Pronounced holorhiny is found only among the Dendrocolaptinæ of which, however, some genera — *Sittasomus, Dendrocincla* and probably others — are typically schizorhinal.

The Philydorinæ (*Philydor, Xenicopsis, Xenops, etc.*) form a transition group leading up to the Dendrocolaptinæ and the species are schizorhinal with the exception of *Automolus* and *Anabazenops* which have the nasal foramen shortened.

When we seek to explain the phylogenetic developments here set forth, it is evident that the forms which present the greatest modification are the Dendrocolaptinæ, which are completely adapted for climbing after the manner of the Woodpeckers. The extraordinarily lengthened exterior rectrices and the protruding shaft points are peculiarities which characterize them as terminal members of a developmental series issuing from the Philydorinæ.

We are able to distinguish among the Dendrocolaptinæ two groups of genera. One of these, beginning with the schizorhinal genera, *Sittasomus* and *Dendrocincla* leads by way of *Dendroplex*, to *Dendrocolaptes* and *Xiphocolaptes* the most powerful forms of the family with the heaviest beaks. The other group beginning with *Picolaptes* leads to forms with extremely long, curved beaks such as *Nasica* and *Campylorhynchus*. *Xiphocolaptes* as well as *Drymornis, Nasica*, etc., are extremely modified members of the family, of considerable size, and their peculiarities can be easily explained by comparison with the structure of the smaller, less specialized, forms.

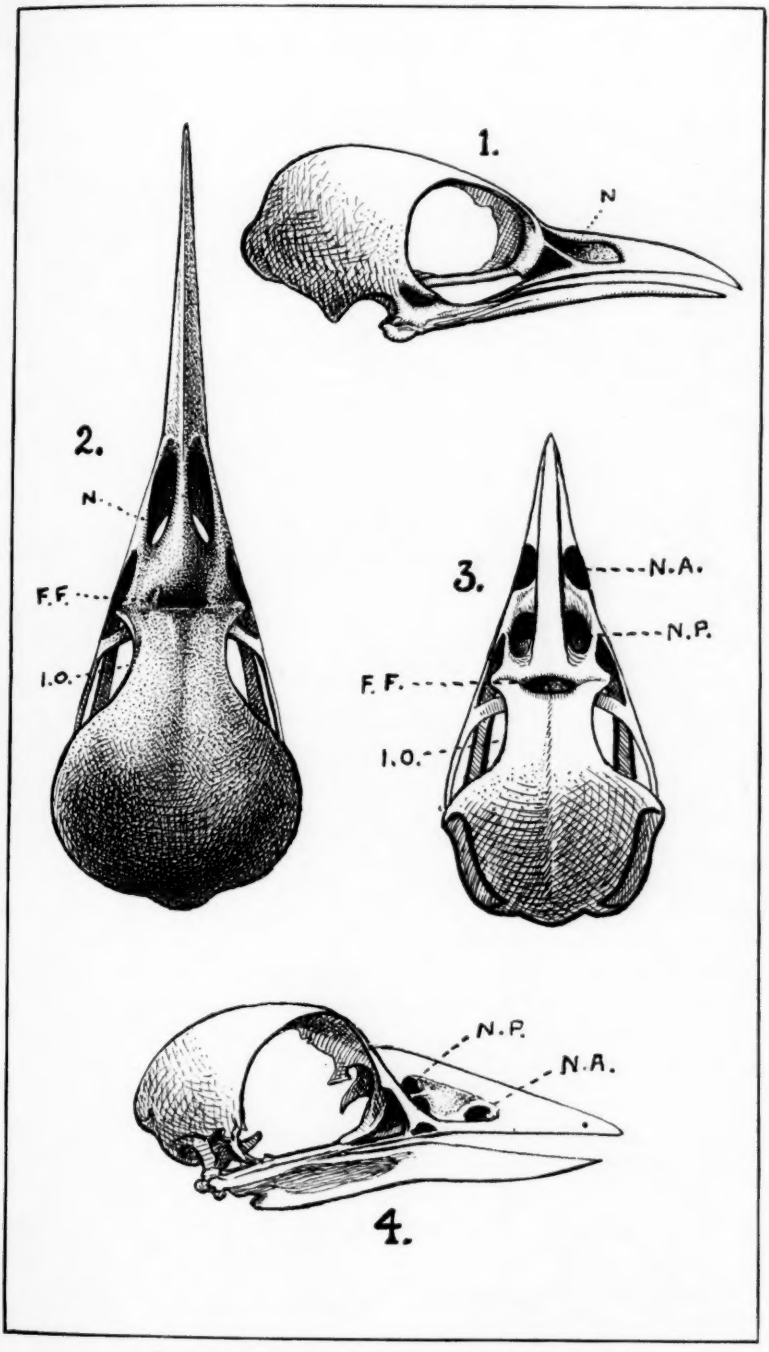
Corresponding with the two groups above indicated we find modifications in the structure of the skull. In both series the strongly modified forms have the frontal bone exceedingly large and the nasal foramen relatively small — the extreme reduction being reached in *Campylorhynchus* and allied genera. By this means the basal bridge between the nostril and frontal bone becomes extraordinarily large and strong, an adaptation corresponding to the increased demand in these birds for strength and resistance at the base of the beak. While the precursors of *Picolaptes* seem to be extinct the line of evolution originating from *Sittasomus* is nearly uninterrupted. The skull of *Sittasomus* differs but little from that of *Automolus* and to this the skull of *Sclerurus*, seems closely related.

With regard to skull structure the Synallaxinæ may be considered as a more or less uniform group in which the genera *Thripophaga* and *Phacellodomus* are somewhat differentiated by the strongly convex base of the beak, prolonged posteriorly in two divergent ridges, surrounding a deep pit.

A peculiarity of the species of *Synallaxis* and *Septornis* is the large, deep median furrow of the frontal bone with a corresponding projecting ridge on the inner side of the skull. There is also a deep pit at the posterior end of the intermaxillary near the anterior end of the frontal. We meet with the same conformation in *Lochmias nematura* where the lateral parts of the frontal bone are extraordinarily convex and separated by a deep median furrow. *Cinclodes* presents the same condition while *Upucerthia* differs somewhat in the more projecting nasals which surround the posterior part of the intermaxillary. The skull of *Upucerthia* resembles that of *Thripophaga* and *Phacellodomus* while *Lochmias* agrees with *Synallaxis*.

Of the subfamilies of the Dendrocolaptidæ proposed by Sclater the least natural one seems to be the Furnariinæ.

There are in general no great differences between the skulls of *Furnarius* and *Synallaxis*. In the former, however, the frontal fontanelle, so well marked in *Synallaxis* is absent, while the frontal bone in *Synallaxis* and allied genera is much narrower than in *Furnarius*. *Anumbius* agrees in cranial characters with *Synallaxis;* and *Pseudoseisura* with *Phacellodomus*. If, therefore, we place *Lochmias* in the Synallaxinæ on the basis of skull structure



SKULLS OF DENDROCOLAPTIDÆ AND FORMICARIIDÆ.

we should be able to find other characters to support our action and these, I believe, exist.

The true Furnariinæ have the tail truncated while in the genera *Lochmias, Upucerthia* and other Cinclodinæ the exterior rectrices are successively shortened. If we consider that this latter condition prevails in general throughout the Dendrocolaptidæ we must realize that the tail structure in the true Furnariinæ is quite a remarkable peculiarity.

The Furnariinæ have probably originated through localization in the vast prairies of the La Plata states and the adjacent parts of Brazil and Bolivia, while the origin of the Cinclodinæ has been in Patagonia and the Andes.

It is not easy to trace the lines of dispersal which have brought about the present distribution of the South American Dendrocolaptidæ but some light is thrown upon the matter by the study of ornithological literature. Of special interest in this connection is the history of *Furnarius,* the Ovenbird, one of the characteristic species of the central Brazilian and Argentine fauna which seems to be still extending its range. When Natterer in the years 1818–1823 explored the state of São Paulo, he did not meet with it although at the present time it is common in the valley of the Parahyba river and appeared some fifteen years ago at Campinas where it nests.

We may also infer that the genus *Cinclodes* in eastern Brazil is a relatively recent immigrant, as also the few species of Pteroptochidæ, a family of Patagonian-Andean origin.

Of several genera of the Dendrocolaptidæ the skull is unknown to me, such as *Margarornis* and *Glyphorhynchus,* so that I cannot form an opinion upon their relationships from cranial characters. It is not, however, my intention to propose here a new system of classification for the family, my aim being rather to furnish new facts based upon biological and anatomical observations which may eventually be of value in the construction of such a system.

As in the Furnariinæ two lines of development have been demonstrated we can presume that the Dendrocolaptinæ sprang from two different groups of the Philydorinæ. Probably the case is more or less the same with respect to the somewhat aberrant genera *Sclerurus, Glyphorhynchus* and *Margarornis.*

It follows therefore, as already suggested by Fürbringer (p. 1419), that the supposed difference between pseudoschizorhinal and holorhinal skulls in the Dendrocolaptidæ does not exist in fact, but that they are modifications of little importance which serve only in a limited degree in the characterization of genera, and not at all in the differentiation of families.

Most families which are related to the Dendrocolaptidæ have the skull holorhinal. We find in them, however, similar modifications to those existing in the Dendrocolaptidæ. For example in the Formicariidæ some species of *Myrmotherula* and *Drymophila* show prolongation of the narrow posterior portion of the nasal foramen almost up to the intermaxillary and it is probable that further studies based upon richer material will demonstrate that among the *Formicariidæ* too there are species with pseudoschizorhinal as well as holorhinal skulls. Of greater importance however is the modification in the bony nostril of the Formicariidæ. In *Batara cinerea* (Plate XII, figs. 3–4) it is closed for nearly its entire length (14 mm.) by a thin vertical osseous membrane, the anterior portion of which is perforated by a nostril 4 mm. in diameter, while the posterior part contains a second nostril communicating with the buccal cavity. I have found the same structure in *Thamnophilus* and *Conopophaga lineata*, the aspect of the several skulls being quite different but the structure essentially the same, except for the fact that the membrane of the nasal cavity remains soft in some and becomes ossified in others.

This style of skull structure in which instead of one large bony nostril we have two, a posterior and anterior one, I propose to call *amphirhinal*.

In the Dendrocolaptidæ, therefore, while the type of structure is always the same and there are no essential anatomical differences, the dimensions and proportions of the different bones and foramina vary to a degree rarely found in one family. The enormous variation in the form of the beak is seen in such genera as *Xenops*, *Synnallaxis*, *Philydor* and *Campylorhamphus*. In connection with the differences in form we find variation in the condition of the nostrils which are in some genera holorhinal, in others pseudoschizorhinal. The base of the beak is also differentiated variously, sometimes provided with an intermaxillary frontal fontanelle, sometimes not; while between the two parietal bones in some

genera a profound median sulcus is developed. The configuration of the skull depends in a great measure upon the breadth of the interorbital part of the frontal bone and the proportion of this to the greatest breadth of the skull (considered as 100) varies from 16 to 50, the absolute measure being in *Synallaxis spixi* 2.4: 14.3 mm. and in *Campylorhamphus trochilirostris* 8.8: 17.2 mm. As already suggested by Fürbringer the study of the variations in the nostrils of the Dendrocolaptidæ has shown that this is a character of secondary value.

The importance which is given in ornithological literature to such terms as holorhinal and schizognathous represents an inheritance from the past century. When Huxley in 1867 published his classic treatise on the classification of birds it seemed as if the skull was to attain the same importance in the classification of birds as it had already reached in the mammalian system.

Six years later Garrod gave to the structure of the nostrils the same importance in avian classification as Huxley had given to the palate structure. And now we ask what is the situation to-day?

The results set forth in this paper with reference to the schizorhiny of the Dendrocolaptidæ confirm the opinion of Fürbringer as stated above; who also (l. c. p. 1034) rejects Huxley's groups based on palate structure. Beddard (l. c. p. 140) also points out that the maxillo-palatine classification is not really satisfactory from a systematic point of view and adds that it is rendered harmless by the fact that the groups are really not as hard and fast as might be supposed from text books in general.

In this, however, I cannot agree with Beddard as generalizations of this sort, rejected by the most competent morphologists, often persist with tenacity in our systematic literature and in many instances hinder the zoölogist from following his own inclination. If in studying any family in the zoölogical system we take one anatomical character as a basis for the arrangement of the genera or species we construct a system which is entirely changed if we make use of some other character. Skull or pelvis, sternum or syrinx, pterylosis or muscles — in nearly every case we obtain a different arrangement.

The result of the exclusive application of certain anatomical characters is seen in Garrod's classification of the Psittaci, which has been accepted by Beddard, in which the South American

Conurinæ are distributed in three different subfamilies, the Arainæ, Pyrrhurinæ and Platycercinæ!

The same process of development of a certain organ is repeated many times independently in different subfamilies and genera and therefore can be applied only to a limited extent in classification.

No single organ is of such importance that we can attribute to it absolute preference and it is never possible to determine à priori whether this or that character will be of most importance in systematic work. It happens sometimes that a relatively insignificant character will prove of great value, as for example the loss of a remex, which serves as a distinction between the large groups of quincubital and aquincubital birds. The quincubital condition is the archaic one and the loss of the fifth remex although representing a higher phylogenetic degree, must be considered as a process of degeneration, for which it would be stupid to make natural selection responsible.

What we learn from ornithological studies is that the wide range of variation which leads, or can lead to the origin of new groups, is on the definite lines of evolution which influence also the less important characters but which do not raise any question of survival since both the primitive and modified types succeed equally well in the struggle for existence.

In more than forty years of uninterrupted biological research I have been unable to discover any facts among free living animals which tend to prove the existence of natural selection, or even to elevate it to the rank of an indispensable or necessary factor in the origin of species. So long as we do not have at our disposal a complete series of morphological and paleontological observations, which would furnish a systematic arrangement of genera on the ground of actual phylogenetic experience, our classifications are more or less a question of our ability to accurately judge the importance of morphological characters for systematic use. Barriers erected by anatomists, however celebrated, during the past three decades should no longer be allowed to present difficulties in our ornithological work.

From the preceding discussion I reach the following conclusions.

1. The assumed difference between schizorhinal and holorhinal skulls does not exist in the Dendrocolaptidæ. The species in which

the nasal foramen is prolonged posteriorly present only a modification of the common holorhinal type, and this condition should be named pseudoschizorhinal according to Fürbringer.

The variations in the palatine structure, moreover, are of no more importance than those of the nasal foramen.

2. The family Dendrocolaptidæ is an entirely uniform and natural one and there are no sufficient reasons for its subdivision into two families.

3. The morphological and biological characters to which I have alluded offer useful data for the systematic disposition of the subfamilies and genera of the Dendrocolaptidæ.

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EXPLANATION OF PLATES.

PLATE XI.

FIG. 1. *Sittasomus sylviellus* (Temm.). × 2.
FIG. 2. *Anabazenops fuscus* Vieill. × 2.
FIG. 3. *Dendroplex picus* (Gm.). × 2.
FIG. 4. *Synallaxis spixi* Scl. Nat. size.

PLATE XII.

FIG. 1. *Synallaxis spixi* Scl. Nat. size.
FIG. 2. *Picolaptes falcinellus* (Cab. & Heine). × 2.
FIGS. 3 & 4. *Batara cinerea* (Vieill.). Nat. size.
N = nostril, A = anterior, P = posterior.
F.F. = frontal fontanelle.
I.O. = interorbital part of frontal bone.

THE OKALOACOOCHEE SLOUGH.[1]

BY FREDERIC H. KENNARD.

Plates XIII–XV.

WE camped on the nights of March 13 and 14, 1914, about three miles north of the "main strand" of the Big Cypress, close beside the trail, in an open glade among the cypress heads; and both nights the wind blew so that I was glad to crawl into the lee of a neighboring tree.

Here we hunted turkeys, obtaining some of both sexes, and collecting several Swallow-tailed Kites, whose nesting season was just beginning, and which I think are, with the exception of the Roseate Spoonbill, the most beautiful birds I have ever shot.

On the 15th we traveled north, along the Immokalee trail for about eight miles, and then struck out across the prairie, skirting the edge of the cypress swamp and pine woods in a northeasterly direction for about seven miles, until we came to a little pine island near the edge of the Okaloacoochee Slough, where we camped for several days.

During the trip I discovered a Swallow-tailed Kite building its nest in the top of a tall, slim pine, near the edge of some pine woods, and close by a cypress swamp. The nest was about sixty-five feet up, and instead of being built against the trunk of the tree, as is so often the case with raptores, was built at the end of an upreaching limb, and from the ground, looked like a rather flimsy structure of sticks, to which the old bird was now adding moss. In shooting this bird I broke his right wing at the pinion joint, and he continued to fly screaming above my head, with the pinion flapping, until I brought him down with another shot. Their powers of flight are certainly marvellous.

En route we saw numbers of cattle, poor scrawny beasts, scattered about the prairie, most of them pretty wild, and every once in

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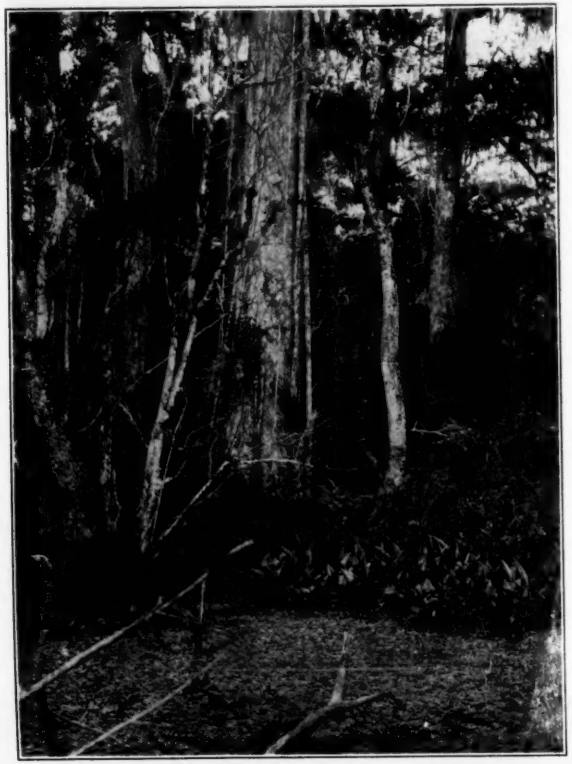
[1] *Cf.* Auk, Jan., 1915, p. 1, for details of this expedition through southern Florida.



1. SWAMP BENEATH THE WOOD IBIS ROOKERY.

2. NESTS OF THE WOOD IBIS.

a while a group of buzzards marked the spot where one had died. We heard but few Sandhill Cranes, until we neared the Okaloacoochee, when we began to see them, often two or three at a time, and flushed one flock of five and then another of seven that flew off "hollering" at our approach. Here also we saw our first Florida Burrowing Owls, and discovered one of their burrows only a short distance from where we were to camp.

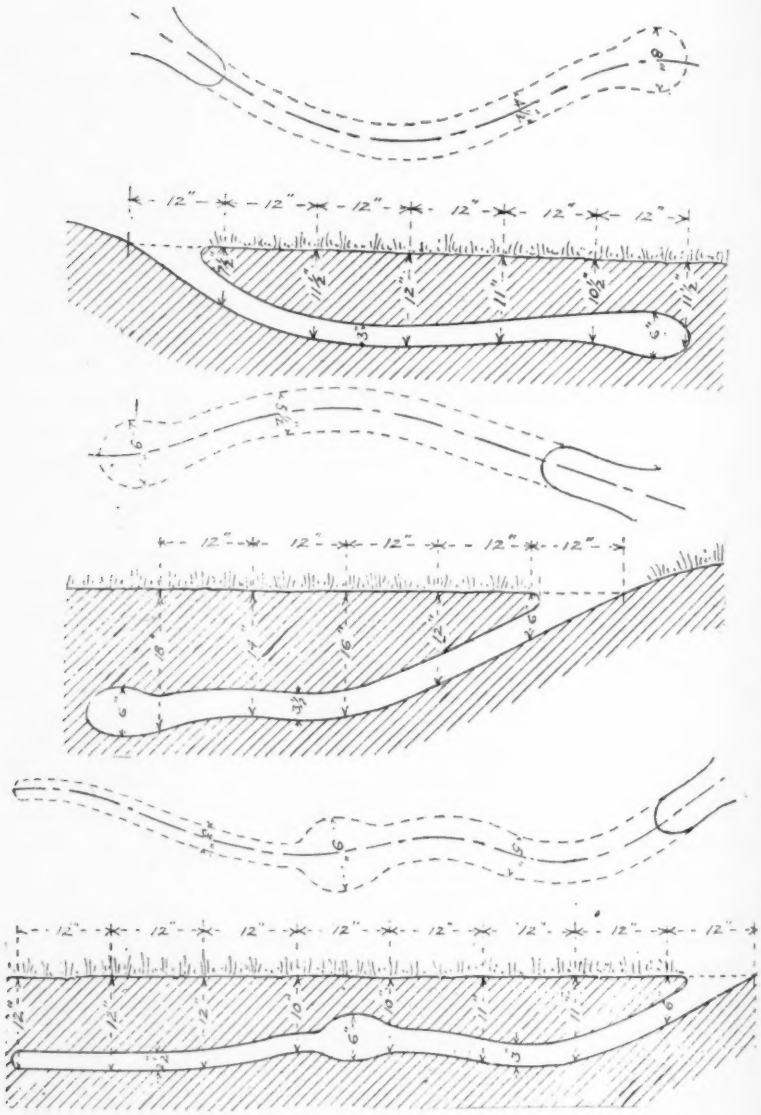
The Okaloacoochee Slough, where we proposed spending the next couple of weeks, is a waterway extending from a few miles south of Fort Thompson, on the Caloosahatchee River, in a southerly direction into the Big Cypress, and from thence to the Gulf. It is bordered by a series of prairies, sloughs, marshes and swamps; most of which are wet throughout the entire year; and seems to be a "fly-way" for all the water birds in that part of the State that do not go up the Gulf coast.

Our first camp was near the southerly end of a large cypress swamp, through which the waters of the slough took their way. The prairie here is dotted with sloughs, the haunt of Sandhill Cranes, the Florida Black Duck, and of countless Herons and Ibises; and east of the swamp it stretches away to the horizon, where the sky line is broken only by an occasional pine island, and by an easterly strand of the Big Cypress, which from here can just be seen.

Here we hunted Cranes and Black Ducks, and I spent much time on the prairie watching the Burrowing Owls. Peter told me they were not nearly so numerous as formerly, when colonies of twenty and twenty-five together were not uncommon; and this was the only location he knew of in Lee County in which these interesting birds still bred.

They build their nests out in the sandy soil of the open prairie, on the higher places, from which the floods have receded, and which here had been burned over earlier in the season. We found numbers of their little mounds scattered about, but hardly thick enough to be called a colony.

On approaching an inhabited burrow, if one or both of the owners were not already in sight, they very quickly appeared; and standing bolt upright on their little mound of sand at the mouth of the burrow, would courtesy gravely to me, until on my nearer



Three Burrows of the Florida Burrowing Owl. Horizontal and vertical sections.

approach, they would fly off onto the prairie, perhaps fifty or a hundred feet, where they would continue their courtesies, uttering at the same time their calls, *Whit, whit-whit,* a long and two short notes: or *Whit-whit, who-who-who-who-whit,* two short notes followed by a stutter, a little lower in tone but ending with a short sharp *whit* at the end; or *Whit-whit, who-who-who-who-who,* two short *whits,* followed by the stutter. Often instead of flying they would run over the prairie, reminding me of the Robins one sees on the lawn, which after standing upright and still, suddenly bend forward and run.

I dug up a number of their burrows, but it was apparently too early to find eggs, though some of the nests appeared to be completed. These burrows, several of which I measured carefully, seemed to run in any direction, east, west, north or south, just as the birds happen to choose, for a distance of from four and a half to eight feet, with the floor of the burrow usually averaging from ten to twelve inches below the surface of the prairie, though we found one that ran as deep as eighteen inches.

The tunnels, which were usually from three to three and a half inches high and from four to five and half wide, ran down grade until about two feet from the entrance, and then nearly on a level, until just before the nest was reached, when there would be a slight rise in the grade, apparently to keep the nest a little above any water that might, in spite of the natural drainage of the soil, gather in the hole in time of storm. The nest chambers, which were oval, were about six inches high and from eight to nine inches in diameter, with a slight depression in the bottom; and those that were nearing completion were rather carefully lined with weeds and grasses, but in no case with cow dung (see article by S. N. Rhoads in 'The Auk' for January, 1892). In several of the burrows we found a small tunnel about two and a half by three inches in diameter, extending for distances varying from eight or ten inches to nearly four feet and ending abruptly. What these tunnels were built for, I am unable to explain, or how the bird managed to make them so small. Of one thing only am I certain, and that is that they were built before the nest was lined.

The little piles of sand at the mouth of the burrows necessarily varied in size according to the amount of excavation. The

largest that we saw measured forty by forty-four inches across, and was only three inches in height. Some of them were very conspicuous, while others were partly overgrown with grasses, and we found one that was in the side of one of those "bull holes" which here dot the prairie — holes pawed in the earth by bellicose bulls.

When the owls flew, they flew softly as all owls do, but rapidly when they so desired, and frequently with high undulations and succeeding dives. They never went a hundred yards from their nests, and we could not drive them away from the vicinity. As soon as we were through investigating their nests, the little birds at once flew back to them, and showed a distress to which I was only reconciled by the knowledge that they would doubtless soon begin to rehabilitate some old burrow, of which there were plenty in the vicinity. Once Tom and I discovered in the distance a burrow from which little jets of sand were issuing with great frequency and regularity, about three to the second, onto the mound in front. One of the birds was just inside the mouth of the burrow, apparently throwing the sand out backwards with his feet.

The owls never seemed to sleep, day or night, at least I never caught them at it, and once I went out on the prairie on a pitch dark night at 3 A.M., in an effort to see if one particular pair was at home, and blocked up the mouth of the burrow, only to find them a few yards away, apparently as well able to take care of themselves in the dark as in the daytime.

On the 18th we found a slough at one end of which was a little willow island, in which there were ten nests of Ward's Heron; seven of them contained well grown young, and three had well incubated eggs. Numbers of Boat-tailed Grackles were building here, some of their nests two or three feet above the water among the vines that hung pendant from the willows, while others were fifteen feet high on the out-reaching branches of the willows themselves. Most of the nests were in process of construction, though a few held an egg apiece, while one contained two eggs and another three. There was a flock of "Curlew" or White Ibises here, together with Louisiana and Little Blue Herons, and a number of Yellow-crowned Night Herons.

We were still in the turkey country and succeeded in picking up

1. FLORIDA BURROWING OWLS AT HOME.

2. NESTS OF WARD HERON.

another fine specimen of the much wanted hen; and gobblers could be heard every morning among the neighboring pine islands. We saw several hawks flying low and hunting over the prairie, that Tom declared were Everglade Kites, but which I never got near enough to shoot, and was unable to identify. I did, however, see several Marsh Hawks. There were also Killdeer and a few Snipe in some of the marshes, and we saw one bunch of about a dozen Greater Yellow-legs.

On March 20th when I had gone out early to see what the Burrowing Owls were up to, I took the following notes, which may be of interest as an account of the early morning bird life that immediately surrounded us.

"3 A.M. Awoke to find the moon about an hour high, and two Horned Owls hooting in the pine woods to the southwest. Do they always hoot as the moon rises, or is it that that is the only time I ever happen to hear them?"

"3.40 Black Ducks calling from slough to the eastward."

"4.20 As I was walking over the prairie the Sandhill Cranes began calling from all directions. Whether or not some of them were first aroused by me I am unable to say."

"4.35 A Chuck-will's-widow made a few calls."

"4.40 A Whip-poor-will after two or three preliminary throat clearers, started in with seventy-six calls, as against one hundred and eighty-eight I heard one make successively yesterday A.M."

"4.45 I can hear two Horned Owls, one Barred Owl, which has been hooting at intervals ever since I awoke, two Whip-poor-wills and one Chuck-will's-widow, all calling at once. The Horned Owls' notes sound thus: *Whoo, who-who-whoo, whoo whoo;* or *Whoo, who-who-whoo, who-who-whoo, whoo whoo;* a far deeper tone than those of the Barred Owl."

"4.50 Black Ducks again set up a squawking, Cranes are 'hollering' all over the prairies, and it is beginning to get light in the east. A Barred Owl is hooting close by, another in the middle distance. and a third far off."

"4.55 Night Herons quawking, Florida Yellow-throats singing in the nearby clumps of saw palmettos, and two Chuck-will's-widows and one Whip-poor-will are apparently trying to sing each other down."

"4.58 Boat-tails are beginning to call, and Jorees (Towhees) are everywhere in the palmettos about us."

"4.59 Black Ducks again squawking, Meadowlarks, Shrikes, Florida Yellow-throats everywhere, and Herons of some kind, either Louisiana or Little Blues calling from the swamp."

"5.03 A Turkey gobbling away off the southwest."

"5.04 Turkey gobbling frequently."

"5.05 More quawking of Herons, Barred Owls continue performance, but Horned Owls seem to have quit. The Okaloacoochee with its low lying fog looks like a huge lake."

"5.06 Jorees and Florida Yellow-throats are calling continuously in every direction. I thought I heard a Song Sparrow in the distance, though it may have been a Savannah."

"5.08 That gobbler is trying for a record."

"5.09 A Cardinal is singing nearby. He may well have sung before, and escaped notice."

"5.16 Quail are beginning to call, the gobbler is calling again, and apparently replying to another that has just started gobbling south of us."

"5.17 Crows are cawing; a little late it seems to me."

"5.19 Red-bellied Woodpeckers and Florida Grackles are beginning to arrive in our grove."

"5.20 A Flicker is calling in the distance, and a big gobbler is gobbling just a short piece up the trail."

"5.32 Pine Warblers, Red-winged Blackbirds and Downy Woodpeckers in the pines about us."

We succeeded in collecting four Florida Black Ducks while at this camp — three drakes and a duck. I forgot to measure the duck before skinning, but the three drakes when laid out on my operating table, each measured twenty-three inches in length, which is considerably longer than the measurements usually given for this species, and I was very much interested in finding that they all, both sexes, had bright coral red legs. The bills of the drakes were very highly colored, and looked to me like the bills of the freshly killed specimens of the northern species. Some, at least, of these birds were beginning to breed, for although we found no nests ourselves, I was later lucky enough to secure a beautiful set of eleven fresh eggs, taken by a friend of Tom's on March 20, in a slough near Immokalee.

A BONNET LAKE ON THE OKALOACOOCHEE.

NEST OF THE SAND HILL CRANE.

On the morning of March 20 our long search for an occupied Crane's nest was rewarded by finding one that contained two well incubated eggs, in a slough away out in the prairie. The old bird, which we jumped directly from her nest, near the middle of the slough, flew off "hollering" and lit out on the prairie, from which point of vantage she could watch the proceedings. The nest was a huge affair about four feet by six in extent, and eight inches above the level of the surrounding water, with a depression about two inches deep, and was constructed principally of the dried stems of what looked to me like the pickerel weed with which most of these sloughs are filled.

In the afternoon we broke camp and traveled northeast across the prairie, around the cypress swamp, at the southerly end of which we had been camping, to a place known as the Widow McLean's Crossing, where a trail from Immokalee to the Seminole reservation crosses the Okaloacoochee.

Here in a sort of glade surrounded on three sides by a wonderful cypress swamp, someone had years ago built a shack, long since in ruins, planted a small grove of grapefruit, oranges and guavas, and cultivated the ground about them. "Lightwood" for our fires, and pasturage, were both in plenty; and we were out of reach of the bothersome prairie winds. There was plenty of good water that actually *ran* through the stream just back of camp; and, wonder of wonders, a place where I could bathe. The air was redolent with the odor of orange blossoms, the place fairly alive with birds, a delightful change after our strenuous experience of the last few weeks.

Late in the afternoon, while putting our camp to rights, the air was full of birds, thousands upon thousands of them flying over us, south to the adjoining cypress swamp. "Flint Heads" (Wood Ibis) in companies and the swift flying "Curlew" (White Ibis) in battalions and regiments, Louisiana and Little Blue Herons by the hundreds, with here and there a sprinkling of "Long Whites" (Egret), all in one continuous stream. Right in the middle of it we were startled by yells from Tom, and on rushing out into the open to see what the matter was, espied two "Pink Curlew" (Roseate Spoonbills) flying rapidly south with the other species.

From all the signs we were led to believe that there must be a

large rookery in the cypress swamp just south of us. The next morning, after making skins of a couple of Limpkins that Tom had collected the night before, we started for the middle of the swamp, above which we could see a number of "Flint Heads" soaring and wheeling high up in the air, very much after the manner of the Black Buzzards. We crossed the slough and coming out onto the prairie, which here stretched away to the easterly horizon, skirted the swamp for a short distance until we came to a trail used by the Seminoles, who come here from all over southern Florida for the huge cypress trees from which they make their dugouts.

En route we saw several Turkeys, and after a short walk came to the edge of one of the prettiest of Florida lakes, perhaps one hundred and fifty to two hundred yards long and from thirty to sixty yards wide, completely surrounded by a growth of wonderful moss-covered old cypress, that seemed fairly alive with birds. Anhingas, in larger numbers than I have ever seen assembled in so small a space, were flying rapidly about or craning their necks as they perched on overhanging boughs. There were Herons of various sorts about the edges of the lake, and numbers of wise looking old "Flint Heads" sitting solemnly among the tree tops. Wood Ducks were swimming among the buttressed trunks of the cypress trees at the border of the lake, and several huge alligators, as we came in sight, were seen to sink slowly beneath the surface of a pool at the southerly end.

I had crawled out on a prostrate stump to take a photograph of the beautiful scene, when suddenly a wonderful "Pink Curlew" came shooting out from one of the side aisles, across the lake in front of me. I must have been seized with something akin to buck fever, for I simple stood there open mouthed and staring, until at a yell from Tom about a dozen more flew out, and I managed to wake up sufficiently to secure three of them. Later we saw several more "Pinks," thirty or forty of them in all.

Of the Spoonbills collected, one was an adult female with egg in the oviduct; while the other two were immature — a male, and a female with ovaries undeveloped. The irides of the immature specimens, instead of being bright carmine, like their elders, were, to quote my notes, "of a nondescript color at first glance blue, but on closer examination a sort of dark hazel."

On Sunday, March 22, we rested and put in most of our time making up skins. The day was overcast and inclined to be rainy, but not enough so to discourage the birds. Cardinals, Mockingbirds, Tufted Titmice and White-eyed Vireos were singing in the trees about us, the occasional scream of Florida Bluejays could be heard, and once in a while the rattle of a Kingfisher flying overhead. Pileated Woodpeckers and Barred Owls called frequently from the slough behind us, and occasionally the squeak of Wood Ducks could be heard in the stream, which fairly teemed with them.

Right in front of my tent were several depressions in the dirt made by Turkeys when "dusting." A pair of Swallow-tailed Kites frequented the nearby pine wood, and the "hollering" of Sandhill Cranes could be heard in the distance. Chipping Sparrows, Florida Meadowlarks, Great Crested Flycatchers, Florida Grackles, Florida Red-wings, Buzzards, Florida Red-shouldered Hawks, Florida Crows, and Fish Crows, were nearly always about camp, and Ruby-throated Hummingbirds were flitting among the grapefruit blossoms overhead. I heard one Blue-headed Vireo. "Flint Heads," White Ibises, and Herons of various sorts were generally in sight, and every once in a while a yell from Tom proclaimed a "Pink" going by.

Some few "Flint Heads" were always on the move, flying back and forth from their rookery. The prairie was often dotted with them, seeking insects, I suppose; and on moonlight nights numbers of them could be seen feeding in the sloughs. About daylight they begin to come out of the swamp in numbers, flying over camp with loud rhythmic whistle of wings, mostly in a northerly direction; straggling along in small companies; perhaps a couple, three, five, seven, or nine at a time, and in one extreme case, twenty-two. In flight they remind me of Brown Pelicans, a few flaps of the wings and then a soar, but their company drill is not nearly so good as that of the Pelicans, who follow their leader with such remarkable regularity.

Every once in a while in the early morning, or late in the afternoon, one hears a great rushing sound like that of a closely approaching wind storm, and a huge flock of beautiful White Ibises goes rushing overhead. In flight they are much more rapid than the Wood Ibis, and seem to set their wings to soar only when swooping down to alight or when turning in their flight.

After breakfast on March 23, Tom and I again started for the "Flint Head" rookery, from which we had been diverted by the Spoonbills two days before. We struck south from the alligator lake through about the worst bit of swamp it has ever been my lot to traverse, wading up to our armpits in water covered with a of skim of "lettuce," or climbing six or eight feet in the air over prostrate trees, balancing ourselves on logs, crawling through vines or almost impenetrable jungle, and always dodging moccasins, until we came to the rookery, perhaps a half a mile from the lake. The cypresses here were magnificent, huge trees four, five, six or seven feet in diameter above the buttresses, and in one case over nine; growing well apart so that most of them had spreading tops.

Here in a strip from one hundred to two hundred yards wide and extending for a mile or so, was the rookery. Not all of the trees were occupied, but most of the good ones held from four or five to twenty nests apiece, clear out on the ends of upreaching branches. At the northerly end of the rookery the nests contained vociferous young. A little farther south most of them appeared to contain eggs, while at the southerly end the nests were still in process of construction. Apparently they had started to build at the northerly end first, and then as the newcomers took up their parental duties from day to day, extended the rookery south.

Here hour after hour there was a constant stream of birds flying back and forth from a clump of willows at the border of the swamp, that was being rapidly denuded of twigs and sticks, which the big birds broke off with their powerful bills and carried to their nests. Tom watched them for some time and reported that when a bird flew up to a willow and lit, it would perhaps grasp several twigs at once with its feet, apparently in order to get a better hold, and then seizing a twig with its bill, would pull and jerk until it broke off, or, if unsuccessful, get hold of some other twig, break it off, and then fly away.

Tom was also lucky enough to get a view at close range of several "Flint Heads" feeding in an open place in the water beneath some "pop ash" trees. He described them as walking solemnly back and forth in water about up to their knees, with tails erect; and when feeding dragging their bills beside them, upside down like a Flamingo, opening and shutting them rapidly

and apparently sifting the mud through them. When meeting, they would often throw their heads back, puffing out their feathers at the base of their necks, and, if quarrelsome, would snap their bills loudly at each other. In the rookery the continual clatter of snapping bills can be heard quite a distance.

We found a number of Spoonbills which were apparently just beginning their nesting season, and saw several standing on what I supposed to be their nests at the top of tall cypresses, while another was engaged in fixing up the lining of its nest.

Tom and I tried to make an approximate estimate of the number of birds in the rookery, but were unable to arrive at any satisfactory conclusion. The traveling was so difficult that we could not undertake to block off the swamp into small areas in which we could count the nests, and we had to content ourselves with guessing. Tom, after further explorations the next day, thought there were at least ten thousand nests of the "Flint Heads," while I felt sure there were more than five thousand. At any rate, there were a great many, and among them a few Spoonbills' nests.

The other birds, White Ibises, Herons, Anhingas, etc., appeared not to have begun breeding, and apparently the first two only used the swamp as a roost. There must have been several thousand White Ibises and perhaps a hundred Egrets that used the swamp, and countless Little Blue, Louisiana and Night Herons of both species. None of these had apparently begun to breed. The season appeared late, and Tom thought that when they did breed they would probably build their nests out among the sloughs and willow islands somewhere on the prairie.

Just east of camp, only a few hundred yards up the slough, was a very lovely "bonnet" lake, a feeding ground for many of these birds, and at its outlet I collected several Wood Ducks of both sexes, adults in full breeding plumage. As Florida Wood Ducks are thought, by some of the gunners there, to be rather smaller than our northern species, I took pretty careful measurements and found them to be identical as to wings, tail, tarsus and bill. In length four birds measured seventeen and one half inches when stretched to their utmost immediately after killing, and one reached seventeen and three quarters.

On March 26 we broke camp, yoked up our oxen, and left this

pleasantest of camp sites for the Burnt Pens, ten miles away on the trail to Fort Myers.

On the way to the Burnt Pens we had a very interesting experience with a pair of Sandhill Cranes, whose young we discovered "*peeping*" out on the prairie. Its *peeps* were to us absolutely indistinguishable from the calls of the numerous Jorees in the surrounding saw palmetto, and the solicitude of its parents was almost human.

We spent the night at the Burnt Pens and the next day, March 27, Tom and I left for Fort Myers in the automobile, leaving Peter to follow with the schooner.

I am glad to report that Tom Hand returned later to the Okaloacoochee as warden, under the auspices of the National Association of Audubon Societies. There are still a few "crackers" who have not yet been educated against plume hunting, and as we had, while camping there, seen suspicious tracks in the swamp, Mr. T. Gilbert Pearson very gladly complied with the suggestion that someone be sent there to watch the rookery and its vicinity until the end of the breeding season.

CABOT'S TYPES OF YUCATAN BIRDS.

BY OUTRAM BANGS.

DURING the early days of the Boston Society of Natural History, in the "fortys," Dr. Samuel Cabot, Jr., was for a short period an active ornithologist. He collected birds vigorously himself and exchanged with many European naturalists and dealers. He also accompanied Stephens on his second expedition to Yucatan, and remained in that country from October, 1841, until June, 1842, visiting Cozumel Island at some time during that period. He made a collection of birds, which, judged by the rather informal list published in the appendix to 'Incidents of Travel in Yucatan' by John L. Stephens (Vol. II, p. 469), must have been fairly representative, and was certainly the first collection of any size to come out of the region.

Altogether Dr. Cabot amassed a collection of the birds of the world that at the time must have been a very fair working collection. He followed the custom, unfortunately too prevelant among naturalists of his day, of keeping very insufficient data — or none at all — attached to his skins. Soon after his death in 1885 his birds were presented to the Boston Society of Natural History. At that time the collection had dwindled sadly from its former numbers, largely, I have been told, on account of the depredations of the cloths moth, and partly, I feel sure, from specimens having been mounted with no record of whence they came then put on exhibition, and finally lost sight of.

Last year the collection was again transferred, this time to the Museum of Comparative Zoölogy, where I have carefully gone over it all.

A charming little account of the bird work of Dr. Cabot and his two brothers can be found in Brewster's 'Birds of the Cambridge Region,' beginning on page 81. A still more intimate acquaintance with Dr. Cabot's activities can be had from a large portfolio, preserved in the library of the Boston Society of Natural History and containing manuscripts of his various papers, many unpublished anatomical discussions often accompanied by fine original drawings, lists of exchanges and letters from most of the ornithologists of his day, both European and American.

Dr. Cabot during his short career as an ornithologist described no new birds except those collected by himself in Yucatan. The types of all except two of these I have found.

Besides the types listed below there still exist specimens of the following species, that for one reason or another I am certain were collected by Cabot himself in Yucatan.— *Agriocharis ocellata* (Cuv.); *Eupsychortyx nigrigularis* (Gould); *Columba leucocephala* Linn.; *C. flavirostris* Wagl.; *Melopelia asiatica trudeaui* (Audubon); *Colymbus dominicus brachypterus* Chapman; *Asarcia spinosa* (Linn.); *Ajaja ajaja* (Linn.); *Florida cærulea* (Linn.); *Dichromanassa rufa* (Bodd.); *Leucophoyx candidissima candidissima* (Gml.); *Polyborus cheriway* (Jacq.); *Buteo borealis calurus* Cass.; *Asturina plagiata* Schl.; *Rupornis magnirostris conspecta* Peters; *Urubitinga anthracina* (Licht.); *Herpetotheres cachinnans* (Linn.); *Glaucidium brasilianum ridgwayi* Sharpe; *Amizilis rutila rutila* (Delattre);

Chlorostilbon canivetii canivetii (Lesson); *Thamnophilus doliatus yucatanensis* Ridg.; *Platypsaris aglaiæ yucatanensis* Ridg.; *Tityra semifasciata personata* (Jard. & Selby); *Mimus gilvus gracilis* (Cabanis); *Planesticus grayi tamaulipensis* (Nelson); *Cyclarhis flaviventris yucatanensis* Ridg.; *Dendroica bryanti bryanti* (Ridg.); *Guiraca cærulea cærulea* (Linn.); *Arremonops verticalis* (Ridg.) and *Icterus gularis yucatanensis* Berlepsch. Some others I suspect were really collected by Dr. Cabot in Yucatan but there is now no way of proving the fact.

Following is a list of the Yucatan birds described as new by Cabot with an account of such of the types as remain.

Sterna sandvicensis acuflavida Cabot. *Sterna acuflavida* Cabot, Proc. Bost. Soc. N. H., Vol. II, p. 257, 1847. Tancah, coast of Yucatan, April 25, 1842.

One specimen only, mentioned.

TYPE now, M. C. Z. no. 72571.

Micrastur melanoleucus (Vieill.). *Falco percontator* Cabot, Boston Jour. of N. H., Vol. IV, p. 462, Jan. 1844. Edge of the great cenote at Chichen Itza, Yucatan.

Two specimens, ♂ and ♀ adult.

COTYPES now ♂ M. C. Z. 72572; ♀ M. C. Z. 72573.

Eumomota superciliosa superciliosa (Sandbach). *Momotus yucatanensis* Cabot, Proc. Bost. Soc. N. H., Vol. I, p. 156, 1843. Boston Journal, of N. H., Vol. IV, No. 4, p. 466, Jan. 1844. "Throughout Yucatan, particularly at Chichen Itza."

The number of specimens preserved was not stated by Cabot. One example still exists. This TYPE is now M. C. Z. no. 72575.

Centurus dubius dubius (Cabot). *Picus dubius* Cabot, Proc. Bost. Soc. N. H., Vol. I, p. 164, 1844. Boston Journal of N. H., Vol. V, p. 91, 1845. Uxmal, Yucatan, Nov., 1841.

One specimen an adult ♂.

TYPE now, M. C. Z. no. 71785.

Chloronerpes rubiginosus yucatanensis (Cabot). *Picus yucatanensis* Cabot, Proc. Bost. Soc. N. H., Vol. I, p. 164, 1844. Boston Journal of N. H., Vol. V, pt. I, p. 92, 1845. Road from Chemax to Yalahao, Yucatan, March, 1842.

One specimen, ♂.

This cannot now be found.

Dryobates scalaris parvus (Cabot). *Picus parvus* Cabot, Proc. Bost. Soc. N. H., Vol. I, p. 164, 1844. Boston Journal of N. H., Vol. V, p. 92, 1845.[1] Ticul, Yucatan, December, 1841.

[1] Original reference cited in error in Ridgway, 'Birds of North and Middle America.' Part VI, p. 249, as Jour. Ac. Nat. Sci. Phila, V, 1845, 90.

One specimen, ♂.

This specimen also appears to be lost.

Amizilis yucatanensis yucatanensis (Cabot). *Trochilus yucatanensis* Cabot, Proc. Bost. Soc. N. H., Vol. II, p. 74, 1845. "The most common hummingbird in Yucatan." The "*specimens*" from which it was described were taken "about the acacias which grew upon the tops of the ruined buildings."

One of the TYPES still exists; now no. 72512 M. C. Z.

Thryomanes albinucha (Cabot). *Troglodytes albinucha* Cabot, Proc. Bost. Soc. N. H., Vol. II, p. 258, 1847. Near Yalahao, Yucatan, April 6, 1842.

One specimen, TYPE now M. C. Z. no. 72514.

Psilorhinus mexicanus vociferus (Cabot). *Corvus vociferus* Cabot. Proc. Bost. Soc. N. H., Vol. I, p. 155, 1843. Boston Journal of N. H., Vol. IV, p. 464, 1844.

Casa del Gobernador; Yturbide and Izamal, Yucatan.

Three specimens, ♂ ♂ ♀.

One of these, I learn from Dr. Witmer Stone, is preserved in the collection of the Academy of Natural Sciences of Philadelphia. It was presented by Prof. S. F. Baird who apparently obtained it from Dr. Cabot and is marked as the TYPE (No. 3096 A. N. S. Phila.).

Icterus mesomelas mesomelas (Wagler). *Oriolus musicus* Cabot. Proc. Bost. Soc. N. H., Vol. I, p. 155, 1843. Boston Journal of N. H., Vol. IV, p. 465, 1844.

Ticul and Macoba, Yucatan.

Three specimens, ♂ ♂ ♀.

One of the TYPES still exists; now M. C. Z. no. 72515.

Piranga roseo-gularis roseo-gularis Cabot. *Pyranga roseo-gularis* Cabot. Proc. Bost. Soc. N. H., Vol. II, p. 187, 1846. Boston Journal of N. H., Vol. V, p. 416, 1846. On the road from Chemax to Yalahao, April 5, 1842.

One specimen ♂, TYPE now M. C. Z. no. 72518.

Saltator atriceps raptor (Cabot). *Pyrrhula raptor* Cabot, Boston Journal of N. H., Vol. V, p. 90, pl. 12, 1844. "Very numerous throughout Yucatan."

Apparently but two specimens ♂ and ♀.

COTYPES now, ♂ M. C. Z. no. 72574; ♀ M. C. Z. no. 72520.

Under this name Cabot confused two species, describing and figuring as the male the Yucatan form of *Saltator atriceps* and as the female the Yucatan subspecies of *Saltator grandis*.

In his Revision des Tanagriden, Berlin 1910, page 1114, Von Berlepsch described as a new subspecies the Yucatan form of *Saltator grandis*, as *Saltator grandis yucatanensis*, and Peters (Auk, 1913, p. 380), set up Cabot's name for the Yucatan form of *Saltator atriceps* — *Saltator atriceps raptor*.

Besides the Yucatan birds described by himself, Cabot collected in Cozumel Island, two specimens of a yellow honey creeper, that was after-

wards named by Prof. Baird. One of these was mounted and put on exhibition in the Boston Society (it is now M. C. Z. no. 72580) and probably Baird did not have it. The other, still a skin, bears a label on which "type" is marked, in, I think, Baird's handwriting.

Cœreba caboti (Baird). *Certhiola caboti* Baird, Am. Nat., Vol. VII, p. 612, Oct. 1873, Cozumel Isl. 1842. TYPE now, M. C. Z. no. 72525.

The only other type — so far as I have been able to ascertain — in the Cabot collection was,

Tragopan caboti (Gould). *Ceriornis caboti* Gould, P. Z. S. 1857, p. 161. Figured in Birds of Asia, VII, pl. 48. This specimen, is now M. C. Z. no. 73213. It was mounted and had been somewhat battered, during its many changes of abode, but has been remade into a very good skin by Mr. George Nelson.

THE ATLANTIC RANGE OF LEACH'S PETREL (*OCEANODROMA LEUCORHOA* (VIEILLOT)).

BY ROBERT CUSHMAN MURPHY.

ACCORDING to the A. O. U. Check-List, 1910, the western Atlantic range of Leach's Petrel extends from breeding grounds in southern Greenland south casually to Virginia. In the eastern Atlantic the species is known, either as a regular visitor or as a wanderer, at the Azores, Madeira (Nov.), Canary Islands (Nov.), Cape Verdes (Jan.), and the coasts of Sierra Leone and Liberia (Bannerman, Ibis, Vol. II, 1914, pp. 450, 451). Specimens have also been taken in January and March between the Equator and 5° N. latitude, in the longitude of the Cape Verdes, or in approximately the geographical center of the tropical Atlantic Ocean (Salvin, Cat. B. Brit. Mus., Vol. XXV, 1896, p. 350).

During the cruise of the whaler *Daisy*, 1912–1913, I observed and collected *O. leucorhoa* over an area which extends farther to the west and south in the equatorial Atlantic than the previously known range of the species.

RECORDS OF COLLECTION.

September 9, 1912, 28° 36′ N., 31° 45′ W. (Latitude of the Canary Islands; west of the meridian of the westernmost Azores.) The calmest day I have ever seen, and excessively hot. The glare of the mirroring sea was blinding. The water was dotted with the tiny, translucent sails of sallee-men (*Velella*); pelagic insects (*Halobates*), so rarely visible, left long wakes in the flat, impressionable sea; and large areas of the substance which whalemen call "tallow drops" drifted slowly past the brig. Early in the forenoon small dark petrels were seen flying about erratically in the distance, and, lowering the dory, I collected the first example of *Oceanodroma leucorhoa*. I remained in the boat about an hour, "chumming" for the birds with grease, but none other came near.

September 27, 10° 46′ N., 24° 38′ W. (South of Fogo, Cape Verde Islands.) Calm, with a heavy swell; overcast; northerly breeze toward evening. Among a flock of *Oceanites oceanicus* which fed about us on this day were eight Leach's Petrels. The latter could be readily distinguished by their slightly larger size, longer wings, and notably different style of flight. *Oceanodroma* flies with rapid, "leaping" strokes, quite unlike the alternations of gliding and synchronous flutters which characterize the flight of *Oceanites*. An observer who has once had the good fortune of watching the two species together can thereafter distinguish them almost as far away as the birds can be seen.

I lowered the dory and shot three of the Leach's Petrels.

On September 30, I saw another *Oceanodroma*, but could not lower.

October 3, 6° 46′ N., 24° 35′ W. At nine o'clock in the evening the crew was engaged in boiling sperm whale blubber, the cresset over the try-works casting a red glare against the limp sails, when a dazzled petrel tumbled onto the deck. It fluttered about, bewildered, but managed to escape. Two others were caught during the night, however, and both proved to be *O. leucorhoa*. One of them I banded and freed.

April 18, 1913, 3° 40′ S., 33° 35′ W. (Between Rocas Reef and

Fernando Noronha). Fair, with light easterly winds. We passed close enough to Rocas Reef so that the signal and buildings could be seen from the masthead. One *Oceanodroma*, among the *Oceanites*, flew about our stern for a few minutes.

April 19, 3° 15′ S., 33° 40′ W. Flat calm all day and well into the night. I lowered the dory and collected a dozen petrels, three of which were *Oceanodroma leucorhoa*. One of these had lost a leg above the tarso-metatarsal joint, but it seemed to obtain its food as well as the others. The "springy" flight again struck me as quite distinctive. Unlike Wilson's Petrel the Leach's Petrels settled frequently into the water, holding the tips of their wings high while they swam.

April 23, 1° 34′ S., 34° 18′ W. Calm; showers. One *Oceanodroma* seen.

May 4, 13° 16′ N., 51° 34′ W. (Due east of Barbados, W. I.) Moderate trade winds. An *Oceanodroma* flew about us for a while during the morning. I was enabled to watch it very closely, and there can be no doubt whatever regarding the identification. The record is particularly interesting, partly because the locality is almost within the Lesser Antillean region, and also because the date is about the beginning of the normal breeding season for this species in the temperate North Atlantic.

NOTES ON THE SKINS.

All the specimens collected in the tropical Atlantic are indistinguishable from birds taken at Grand Manan and elsewhere near the North American breeding grounds. It is perhaps needless to say that I have avoided a possible confusion with *O. castro*.

The sequence of the plumages is interesting. The specimen taken on September 9, an adult female, is moulting its worn and much faded feathers, a few new, gray scapularies and half-grown rectrices contrasting strongly with the dingy brown of the adjacent plumage. Two September 27 specimens have a completely new garb with the exception of the three outermost primaries which are frayed. The birds collected on April 19 have new quills, and contour plumage which is nowhere greatly worn.

CONCLUSIONS.

Oceanodroma leucorhoa occurs regularly in the tropical Atlantic from September to April or May. It has been taken on and south of the Equator in March and April. The range of the species should be restated in part as follows: — Breeds from southern Greenland and the Faeroes south to Maine and the Hebrides; south in migration to the Equator and the vicinity of Cape San Roque, Brazil.

SOME SUGGESTIONS FOR BETTER METHODS OF RECORDING AND STUDYING BIRD SONGS.

BY ARETAS A. SAUNDERS.

UP to the present time our methods of recording bird songs have been lacking in uniformity. We realize the fact that bird songs are a great help in field identification of species, when once learned. We admit that a knowledge of these songs is as much to be desired as a knowledge of plumage or migration, that it should occupy as prominent a place in the science of ornithology. But if we search through various writings for records of the song of a given species, we find a heterogeneous and uncertain mixture of data that do not give us any satisfactory impression of the song. Various methods have been used to describe and record bird songs, but so far, only one method, that of musical notation, has been possessed of any scientific accuracy.

Musical notation, as a method of recording bird songs, has been subject to a great deal of adverse criticism. It has been made primarily for the recording and rendering of human music and birds do not usually sing according to such standards. The musical scale gives no place for the recording of notes that are slightly sharp or flat. Its standards of time do not allow the record of a song that does not follow the rhythmic beat of its measures. Do

birds sing in any given key? Do they recognize any fundamental notes? Can one beat time to a bird's song? In the majority of cases these questions must be answered in the negative. Only a few individuals of certain species approach these standards of music. The great majority of birds sing in a free, non-mechanical, natural manner that cannot be recorded on the musical scale with the exactness that it deserves. If we have no better method we must resort to musical notation, but if we can find a better method, one which discards the mechanical rules of human music, without losing any of its scientific accuracy, we can take a long step in advance toward the true scientific study of bird song.

Before discussing the possibilities of such a method, it is first essential to have a definite classification of the points concerning which we desire information to make our knowledge of a given song complete. These points appear to me to be five in number. They are pitch, duration, intensity, pronunciation and quality. Concerning quality I have no suggestions to offer farther than those already made by others. Sound qualities are baffling and difficult to describe with accuracy, and, until we can have a definite and practical classification of them, they will continue to be so.

Our records of pitch, duration and intensity must be first comparative, for the different notes or parts of a given song, and second absolute, for a comparison of the song with other songs of the same or another species. A pitch pipe, together with a good musical ear, are necessary to obtain the comparative and absolute pitch in the field. A stop watch is probably the best instrument with which to get records of duration. Comparative intensity can be recorded with reasonable accuracy by ear, but absolute intensity is more difficult to measure. The intensity of a song must necessarily vary with the weather conditions, the temperature, the pressure of the air, and above all the direction and velocity of the wind. We know, however, that the intensity of sound varies inversely as the square of the distance from its source, and this gives us something tangible to go by. If then, our bird will remain in one spot singing, on a day when there is no wind, while we find the farthest point at which the softest and loudest parts of its song are audible, we will have a definite measure of intensity. This process seems destined to try to the utmost the patience and perseverance of the future student of bird song.

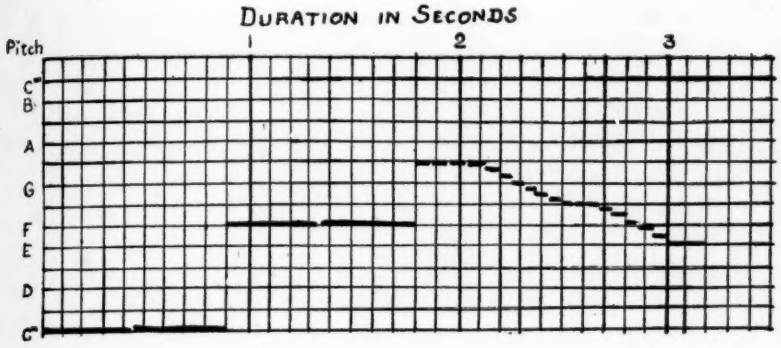


Fig. 1. Song of the Vesper Sparrow. West Haven, Conn., April 23, 1914, 6 A. M.

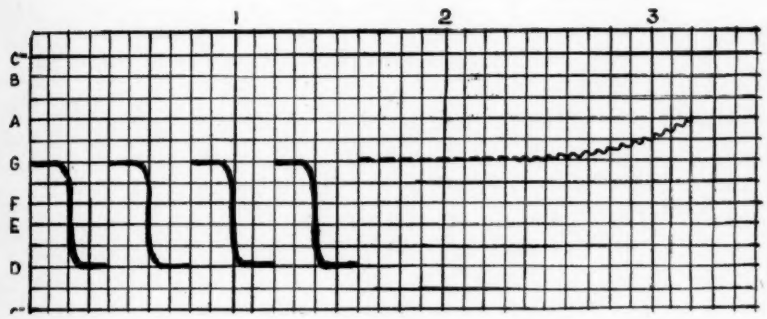


Fig. 2. Song of the Field Sparrow. West Haven, Conn., April 18, 1914, 9 A. M.

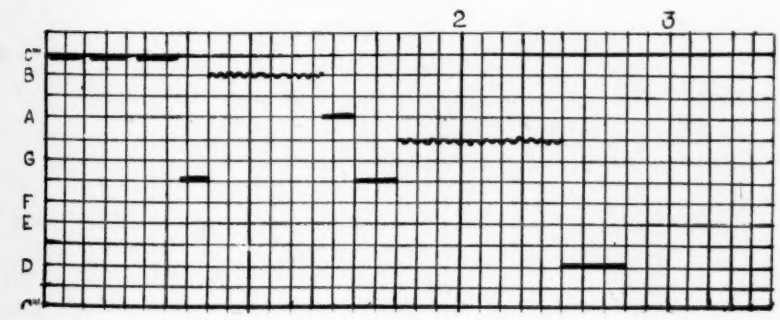


Fig. 3. Song of the Song Sparrow. Gunhill Road, N. Y. City, April 3, 1914, 9.15 A. M.

The following method has occurred to me by which the pitch and duration of a song may be represented graphically, when once it is determined. This method is to represent the song by lines on ordinary coördinate paper, plotting the pitch along the ordinate, that is in a vertical direction, and the duration along the abcissa in a horizontal direction. In order to see whether this method was practical, I tested it in the field during the spring of 1914, recording 104 different songs and call-notes, representing 18 different species. The species included both birds with simple songs, such as the Junco and Phœbe, and others with more complicated songs such as the Song Sparrow (fig. 3) and Purple Finch (fig. 4). It also included some bird sounds not properly classed as songs, such as certain call-notes of the Flicker and the scream of the Red-shouldered Hawk.

Of course this method is not without its difficulties. It is usually impossible, even with the simplest songs, to record them after one hearing only, and with a long continued song, it is only possible to catch and record phrases here and there. Such difficulties, however, would be just as great, or even greater in using musical notation. I have tried several times to record bird songs by musical notation, and am certain that this graphic method is much simpler, and much more easily used and mastered than is the other. In the matter of pitch, one does not have to ascertain whether the bird is singing in three flats, five sharps or something else. If the bird flats a little, or uses an interval not strictly a fifth, seventh, or some other known to human music, this fact may be shown and need not be modified to fit the human standard. In the matter of time the same things are true. Notes need not be reduced to quarters and eighths when they really have no such definite relations to each other, but may be represented in their actual true duration. In short, the method, like the bird's song itself, is natural, and does not follow any fixed rule of either pitch or time.

The unit of measurement of pitch is of course the octave, but this is not divided into eight parts as on the musical scale, but into twelve parts, representing the twelve half-tones. Thus B and C, and E and F are shown in their true relations, half a tone apart, and not, as on the musical scale, spaced the same distance apart as

notes that are separated by a whole tone. The unit of time is not the measure, further modified by the addition of adagios, allegros or numbers signifying beats per minute, but is the second, a unit that is uniform and unchanging, and thoroughly understood both by musicians and by the uninitiated. The second may be further divided into fifths, the smallest unit that can be recorded by an ordinary stop watch. I have found that in practise it is still better to divide it into tenths, so that short, rapidly repeated notes may be easily represented, and lengths of songs may be expressed in decimals.

In putting this method into practise, I have found a few modifications from the definite rules necessary in order to record the characters of all songs clearly. A rest, or pause in a song would of course be represented by a break in the horizontal continuity of the lines representing it. Many bird songs, particularly those of the sparrows, contain series of short, rapidly repeated notes all on the same pitch, without a pause between them. If the method were rigidly adhered to, these would be represented by a continuous straight line, and the separate notes could not be distinguished. In order to avoid this I have written such songs with a slight break in the horizontal lines to keep the distinct notes separate, although there is really no pause in the song. When such notes become so rapid that the number cannot be counted, the note becomes a trill. I have represented trills by continuous, slightly wavy lines, the wave not representing any variation in pitch, but the pitch of the note being recorded by the central axis of the wavy line. These conditions are shown in the illustrations of songs of the Song and Field Sparrows.

The illustrations will suffice to make more clear the graphic method of recording songs. I have used the letters C′, C″, C‴, etc., to indicate middle C and the octaves above it. Where notes on different pitches are slurred together, I have represented this fact by connecting them by an almost vertical line. Such slurs are characteristic of the Meadowlark's song (fig. 7) and are also found in the introductory notes of the Field Sparrow record (fig. 2). One criticism of my method that has been made is that all notes are not connected by these vertical lines, to give the songs more continuity of appearance. This would make it diffi-

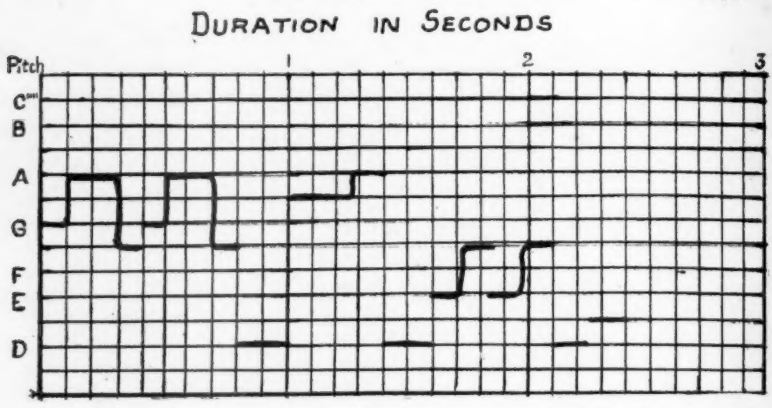


Fig. 4. Song of the Purple Finch. West Haven, Conn., April 28, 1914, 5.30 P. M.

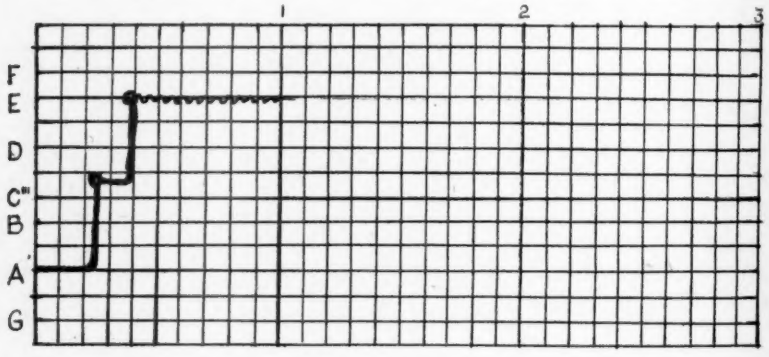


Fig. 5. Song of the Red-winged Blackbird. Gunhill Road, New York City, April 3, 1914, 8.30 A. M.

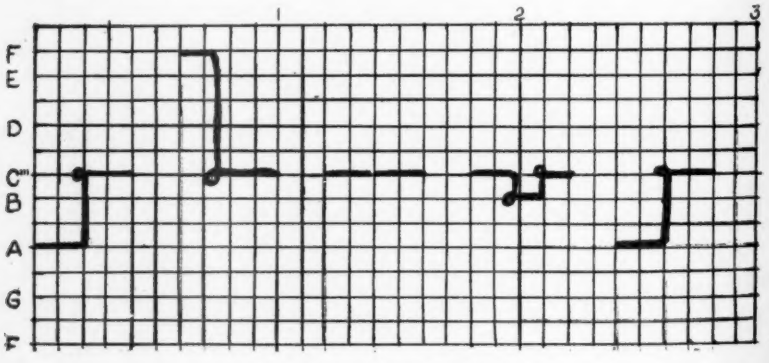


Fig. 6. Song of the Robin. West Haven, Conn., April 17, 1914, 5.30 P. M.

cult to distinguish between notes that are slurred together by the bird and those that are clearly separate. This difficulty is at best a slight one. The disconnected appearance of the songs may seem great at first glance, but becomes insignificant as one becomes accustomed to the method.

By this same method it is also possible to represent the variations in intensity of a bird song. This could be done by variation in the breadth or heaviness of the lines, making heavy lines for the loud notes, and light lines for the softer ones. I have not yet attempted to measure the intensity of bird songs in the field so have omitted this factor from the illustrations.

The factor of pronunciation is one that presents some difficulties. To just what extent birds produce recognizable vowel or consonant sounds in their songs it is hard to say. It is probably true that a purely musical note has no real vowel sound and that the only difference in such notes is that of quality and not pronunciation. Consonant sounds, however, may be occasionally recognized in bird songs and call notes. The "k" sound in the call note of the crow, for instance, is universally recognized. In true songs I believe that the explosive consonants, such as "p," "k," "t" etc., are rare. The commonest consonant sounds are liquid ones, such as "l" and "r", connecting different notes. In the songs I have studied and recorded, the liquid "l" is the only consonant I have recognized. This sound is quite common in the songs of many species and is evidently an important distinguishing character. I have represented the presence of this sound by a loop, at the beginning of the note introduced by it, as shown in the songs of the Robin (fig. 6) and Redwinged Blackbird (fig. 5).

One of the first things that one notes after studying songs for a time in the field is that even the simplest and commonest songs are tremendously variable. This variation extends not only to different individuals, but also to different songs by the same individual. The song of the Meadowlark is one that is quite simple and easy to record, and yet shows enough variation to make a very interesting study (fig. 7). I have recorded thirty different songs of the Meadowlark by the graphic method, and believe that with time and opportunity I could record three or four times as many. Seven of these songs were sung by the same bird during an hour's time.

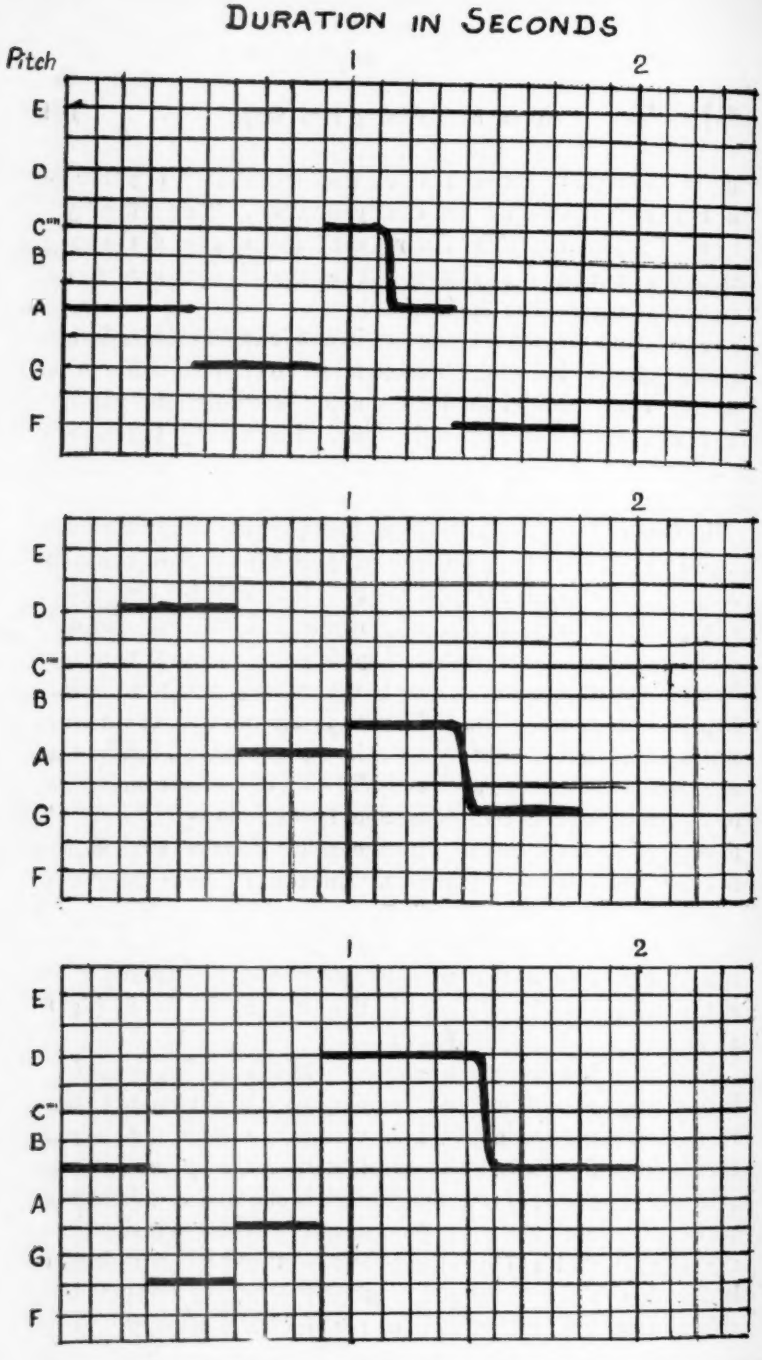


Fig. 7. Three Songs of the Meadowlark. No. 1. West Haven, Conn., October 18, 1914, 3 P. M. No. 2. Mt. Vernon, N. Y., April 7, 1914, 5 P. M. No. 3. West Haven, Conn., April 21, 1914, 5.30 A. M.

The song of the Song Sparrow is even more variable. Not only does each individual have two or more totally different songs, but I have yet to find two individuals whose songs are at all alike. It seems probable that the number of variations of the Song Sparrow's song is greater than the number of individual Song Sparrows.

Since the variations in the song of a single species are so great, a question arises as to what are the factors in which these variations resemble each other. The songs of both the Meadowlark and the Song Sparrow, except in unusual instances, are easily recognized in the field. What characters then are specific? Quality undoubtedly is one. But quality is not the only one, for songs of different species may often have the same quality and yet be easily distinguished. To determine the others it becomes necessary to record a large number of songs of the same species. By comparison of these the points of similarity may be determined, and the amount of variation to which the song is subject may be shown.

I have not yet recorded enough songs of any one species to make a complete study of the song of that species, or to make any statements concerning it that are general in application. As an illustration of how this may be done, however, I have figured out some results from twenty-seven records of the Song Sparrow's song that are interesting though not conclusive. The longest duration of any of these songs is 3.2 seconds, the shortest 1.8 seconds. The average duration is 2.79 seconds. The highest note in any record is D'''' and the lowest D'', giving a range for the species of two octaves. The greatest range of any one song is twelve half-tones or exactly one octave. The least range is four half-tones. The average range is 8.7 half-tones. All but one of the songs contain one or more trilled notes, and this one contains a series of rapidly repeated notes on the same pitch, differing from a trill only in the fact that the single notes are distinct and slow enough to be counted. This arrangement of notes is also a common character and occurs in fourteen of the songs. Most of the songs begin in a more or less characteristic manner and two such types of beginning are recognizable. The first of these consists of three notes on the same pitch varying from two to three tenths of a second in length. Twelve of the songs, including the one in the illustration show this type of beginning. The second consists of one or two long notes,

followed by four to six rapidly repeated ones, all on the same pitch. Seven of the songs have this type of beginning. The remaining eight songs are irregular and show no definite types. None of the songs show enough similarity in termination to draw any general conclusions.

In this manner, from a large number of records of a single species, one should be able to draw fairly definite conclusions concerning the song even when it is extremely variable. Many other interesting facts concerning bird songs may be deduced by studying and recording them in the field. Thus two Field Sparrows, singing alternately and within hearing of each other, produced songs that were exactly alike in every respect, while two Song Sparrows singing under similar conditions had songs that were dissimilar except for the last three notes which were exactly alike.

Field work in studying and recording bird songs is more or less difficult according to the qualities of the person attempting the work. A good musical ear is absolutely essential. Records made by a person not possessed of such an ear for music would be of no more value than descriptions of plumages made by one who is color blind. A knowledge of music is essential also, but it need not be great. In fact I believe that very little musical knowledge is necessary to use or understand the graphic method of recording songs.

In the absence of a stop watch it is possible to use an ordinary watch provided it is a good one, though its use is more difficult. An ordinary, good watch ticks five times to the second, so that fifths of a second may be measured by listening to the ticks. In making records of songs in the field it is of value to record the date, locality and time of day with the record. These points may serve to show important facts concerning the variation of songs due to these factors.

It is also possible to add the factor of quality to the record by writing a statement of this at the top of the record, as suggested by Mr. Robert T. Moore in his paper on musical notation at the A. O. U. meeting of 1913. I have not done this on my records as I feel that the statements would be too inexact to be of much value. All of the songs I have used in illustration are to my mind of a whistled quality, and I am of the opinion that the differences in

them are largely, if not wholly due to pitch, intensity or the presence of liquid consonants.

Thus, all five of the factors, pitch, duration, intensity, pronunciation and quality, may be recorded on a single sheet by this graphic method. The results, I believe, will be intelligible to musicians, and a little less "like Greek" to those whose knowledge of written music is slight.

LIST OF THE BIRDS OF LOUISIANA. PART VII.

BY H. H. KOPMAN.

(*Concluded from p. 29.*)

247. WESTERN TANAGER (*Piranga ludoviciana*). The only known record of the occurrence of this bird in Louisiana is a specimen taken on March 19, 1898, by Mr. Andrew Allison in Jefferson parish, on the opposite bank of the Mississippi river from New Orleans. It was a parti-colored male, with yellow predominating.

248. SCARLET TANAGER (*Piranga erythromelas*). This bird is seldom very common in Louisiana except for a few days at a time. It is most apt to occur at New Orleans about April 20 and in the early part of October. The earliest date of arrival at the latitude of New Orleans is April 8, 1900, at Bay St. Louis, Miss., and the latest date in spring is May 9, 1903, at Lobdell, La. Considerable waves are sometimes present the latter part of April, and about Oct. 10, 1896, I saw an unusual number in the suburbs of New Orleans. The latest date of departure is Oct. 20, 1897, at Ariel, Miss.

249. SUMMER TANAGER (*Piranga rubra rubra*). Common summer visitor, especially in the higher sections of the State. In the swampy region in the southeastern part it shows a disposition to frequent particular neighborhoods, especially those which are better drained. The earliest date of arrival in the latitude of New Orleans is March 31, 1902, at Bay St. Louis, Miss. The latest date of departure is Oct. 27, 1899 and 1900, at Covington, La. It is sometimes remarkably abundant at New Orleans during waves in the latter part of April and early part of October.

250. PURPLE MARTIN (*Progne subis subis*). Common summer visitor, arriving usually about Feb. 15, becoming common about March 10, and disappearing more or less completely from the southern part of the State about Sept. 15. A large southward flight is usually noted at the Gulf

coast about August 22. The earliest record of arrival at New Orleans is Feb. 7, 1897, and the latest recorded departure is Oct. 22, 1894.

251. CLIFF SWALLOW (*Petrochelidon lunifrons lunifrons*). A rather rare bird in the southern and eastern parts of the State at least. Has been noted in Plaquemines and St. James parishes, along the Mississippi river, in September. Noted also at Bay St. Louis, Miss., in September.

252. BARN SWALLOW (*Hirundo erythrogaster*). Common transient. The earliest date of arrival in spring at New Orleans is March 20, 1894. Usually arrives about April 1, and is commonest the last week or ten days of April, and the first few days of May. Has been noted at New Orleans as late as May 25. Returns usually about August 1, but one was seen at Bay St. Louis, Miss., July 8, 1899. Is more or less common until the early part of October and sometimes later. Was noted at Gulfport, Miss., Nov. 6, 1910, and a few may usually be seen until about Nov. 1.

253. TREE SWALLOW (*Iridoprocne bicolor*). Abundant as a transient; irregularly present and sometimes even common, near the coast, in winter; present through much of the summer, though not known to breed anywhere in the State. Usually becomes common in spring about March 20; remains more or less common until about the 10th or 15th of May. Has been noted in abundance near New Orleans the first week in July. Is most abundant in October, especially after the 10th or 15th, and remains very common until decidedly cold weather in November, about Nov. 15 or 20. Sometimes fairly common at intervals throughout open winters; other seasons rare or entirely absent.

254. BANK SWALLOW (*Riparia riparia*). Apparently not very common anywhere in the State except possibly in the most northern sections, where it may perhaps breed. Noted in the southern part of the State chiefly at the seasons when other swallows are commonest, from the latter part of March to the early part of May, and from August to the latter part of October.

255. ROUGH-WINGED SWALLOW (*Stelgidopteryx serripennis*). Common summer visitor, but apparently not breeding in the extreme southeastern part of the State. Arrives the latter part of March and departs about Nov. 1.

256. CEDAR WAXWING (*Bombycilla cedrorum*). Common chiefly in the latter part of winter, and throughout the spring, even to the last of May or first days of June. It has been seen on several occasions at Bay St. Louis, Miss., however, in October; once on Oct. 13, 1898, when two were seen. At New Orleans, little is seen of it until about Feb. 1, when it arrives to feed on the fruit of hackberry and Japan privet, and the flowers of the elm, It later feeds on the blossoms of the pecan, and finally on the fruit of the mulberry. The latest date of departure at New Orleans is May 19, 1900; at Bay St. Louis, Miss., May 27, 1902, and at Pass Christian, Miss., June 2, 1906.

257. LOGGERHEAD SHRIKE (*Lanius ludovicianus ludovicianus*). The true Loggerhead is a bird of the pineries and other dry locations in Louisiana,

none of this species being found during the breeding season in the fertile alluvial and prairie regions of the southern part of the State. About August 20, however, the Shrike appears at New Orleans, and is fairly common thereafter in the lowland section until the middle or latter part of March. It seems probable, however, that a majority if not all of the birds seen in these localities are Migrant Shrikes (*L. ludovicianus migrans*).

258. RED-EYED VIREO (*Vireosylva olivacea*). Abundant summer visitor wherever there are deciduous trees, though seldom found in the cypress. Generally arrives at New Orleans about March 22, becoming common the last week in the month. Earliest dates of arrival March 18, 1894, and March 19, 1899. Transient movement in fall begins in August, and continues to be heavy until Oct. 10 or 15. Last one is usually seen about Oct. 20. Feeds extensively in fall on the seeds of the Magnolias (*M. fœtida* and *M. virginiana*).

259. PHILADELPHIA VIREO (*Vireosylva philadelphia*). A rather rare transient; spring records lacking; numerous in August, 1893, in heavy growth of willow, hackberry, cottonwood, deciduous holly, and other low trees on the batture of the Mississippi river in St. James parish; the first noted August 2. Noted also in October: Oct. 10, 1896, at New Orleans; Oct. 17, 1897, at Ariel, Miss.; Oct. 15, 1901, at Bay St. Louis, Miss.

260. WARBLING VIREO (*Vireosylva gilva gilva*). Fairly common summer visitor in the southern part of the State, occurring chiefly in shade trees in suburban sections of New Orleans, and in willows along the river and edges of pastures. Arrives the latter part of March; earliest arrival, March 27, 1897. Disappears early in the fall; sings occasionally as late as the early part of September.

261. YELLOW-THROATED VIREO (*Lanivireo flavifrons*). Fairly common summer visitor except in the coastal section. Noted during the breeding season, however, in a suburban locality in New Orleans in 1912, 1913, and 1914. Seldom nesting south of about latitude 31°. Arrives about March 25. Latest date of departure, Oct. 21, 1897, at Ariel, Miss.

262. BLUE-HEADED VIREO (*Lanivireo solitarius solitarius*). Fairly common in midwinter in the fertile alluvial region of the southeast. Appears to arrive usually in October: Oct. 25, 1901, Bay St. Louis, Miss.; Oct. 6, 1905, Biloxi, Miss.; but a single specimen was taken at Diamond, La., Aug. 4, 1893. Latest date of departure, March 24, 1904, New Orleans.

263. WHITE-EYED VIREO (*Vireo griseus griseus*). An abundant summer visitor in all moist or swampy woodland; may be seen occasionally in the coastal section in winter, even singing on mild days in December and January. Becomes common from March 15 to 20, and remains so until about Nov. 1.

264. BLACK-AND-WHITE WARBLER (*Mniotilta varia*). Common transient, especially in the fall, and probably breeds sparingly in the northern part of the State. Usually arrives at the coast about March 20; earliest date of arrival, March 15, 1902, at Bay St. Louis, Miss. Remains until

about May 1. Returns very early; recorded July 4, 1906, at Bay St. Louis, Miss.; commonest in August and September. Last at New Orleans, Oct. 25, 1914.

265. PROTHONOTARY WARBLER (*Protonotaria citrea*). Common summer visitor in river bottoms and swampy regions, especially about sloughs and along sluggish streams. Usually arrives by March 20; earliest arrival at New Orleans, March 15, 1894. Leaves about the end of September, The arrival in the immediate coast section, where it is most abundant, is decidedly earlier than in moist bottoms in the higher parts of the State, where the first are usually seen early in April.

266. SWAINSON'S WARBLER (*Helinaia swainsoni*). Occurs chiefly in wild cane brakes in low woods or along streams. Occurs rather commonly as a spring transient in one of the former of such locations near New Orleans. I found it surprisingly common not only in the cane brakes but throughout a considerable section of rich swampy woods in the same general locality on April 14, 1905. At least twenty-five or thirty were noted in covering a distance of probably ten miles. There was a good deal of water in the swamps at the time. Earliest arrival at New Orleans, March 30, 1905. Have never noted it in fall. May breed sparingly at New Orleans.

267. WORM-EATING WARBLER (*Helmitheros vermivorus*). A transient only in the more southern part of the State, seldom very common, and usually seen only for brief periods. Prefers deep, moist woods. The earliest in spring was noted at Bay St. Louis, Miss., April 5, 1902; the earliest arrival in fall near the coast is August 11, 1897, at Beauvoir, Miss. Latest date of departure in fall, Sept. 30, 1897, at Ariel, Miss.

268. BACHMAN'S WARBLER (*Vermivora bachmani*). In the more southern parts of Louisiana and Mississippi at least, this species is undoubtedly only a transient. Besides the previously published records of its capture on the northern shore of Lake Pontchartrain in Louisiana by Mr. Charles Galbraith (Auk, Vols. 4 and 5), it has been noted by Mr. Andrew Allison in Mississippi on the following occasions: March 26, 1902, Bay St. Louis, Miss.; March 24, 1906, Ellisville, Miss.; July 4, 1906, Bay St. Louis, Miss.

269. BLUE-WINGED WARBLER (*Vermivora pinus*). May breed in the northern part of the State; a rather rare transient in all localities where I have made observations. Earliest date of arrival in spring, March 13, 1902, Bay St. Louis, Miss.: earliest arrival in fall, July 23, 1898, Bay St. Louis, Miss.

270. GOLDEN-WINGED WARBLER (*Vermivora chrysoptera*). A rather rare transient. Appears to migrate rather late in spring and early in fall: August 12, 1897, Beauvoir, Miss.

[NASHVILLE WARBLER (*Vermivora rubricapilla rubricapilla*). This species does not appear to have ever been recorded in the State, though it has been noted at Bay St. Louis, Miss., in September, and I am practically sure of having seen it at Beauvoir, Miss., at the same season.]

271. ORANGE-CROWNED WARBLER (*Vermivora celata celata*). A common winter visitor in the alluvial region of the central southern and south-

eastern portions of the State. Earliest date of arrival, Nov. 19, 1901, New Iberia, La., and latest date of departure, April 3, 1909, New Orleans, Usually commonest from about Dec. 15 to Feb. 15. Often seen in live oaks.

272. TENNESSEE WARBLER (*Vermivora peregrina*). An abundant transient in fall, especially in the alluvial section of the southeast, irregular in spring but sometimes common late in April or early in May. In fall, it usually arrives Sept. 22 or 23, and becomes very abundant in October, especially in weedy fields and about the edges of the woods, often in company with the Indigo Bunting. Departs usually about Nov. 1; latest, Nov. 8, 1913. Earliest arrival in spring, March 12, 1900; latest departure in spring, May 9, 1903.

273. NORTHERN PARULA WARBLER (*Compsothlypis american ausneæ*). An abundant summer visitor, especially in the southeastern part of the State, though found practically everywhere in mixed forest growth on more or less moist ground. Arrives at New Orleans early in March (earliest Feb. 22, 1893) and is sometimes common by March 10 or 12, seldom later than March 15. Nests invariably in the Spanish moss (*Tillandsia*) in the southeastern part of the State. Nesting begins early in April. Prefers the live oak as a nesting tree. Feeds indiscriminately in deciduous trees, however, especially the pecan, elm, maple, locust, tupelo, ash and cypress. Remains common until at least Oct. 20; latest date of departure, Oct. 26, 1899, Covington, La.

274. CAPE MAY WARBLER (*Dendroica tigrina*). A record of its occurrence (New Orleans, April, 1890) noted by Prof. Beyer in his list of the Birds of Louisiana is the only one of which I have any knowledge.

275. YELLOW WARBLER (*Dendroica æstiva æstiva*). Abundant transient, especially in the late summer and fall; breeds occasionally except in the extreme southernmost section of the State. Has been noted as a breeder at Baton Rouge by Mr. Andrew Allison and in Pointe Coupee parish by Mr. A. B. Blakemore. Usually arrives at the Gulf Coast the first week in April — earliest, March 30, 1904, and is commonest usually from about April 15 to April 25. Latest date in spring at New Orleans, May 4, 1897. Reappears usually in the latitude of New Orleans about July 15 — earliest, Bay St. Louis, Miss., July 7, 1899; and becomes very common by the end of July. Remains common in August and throughout the greater part of September, though there are periods of increased abundance from time to time. Latest date of departure at New Orleans, Oct. 15, 1903.

[BLACK-THROATED BLUE WARBLER (*Dendroica cærulescens*). Though reputed to occur in the State, I have never seen it, have no knowledge of any specimens being taken in Louisiana, and am unable to find any well authenticated record of its occurrence. I saw what I thought was an individual of this species at New Orleans March 26, 1897, but did not observe it satisfactorily and was by no means convinced of its identity.]

276. MYRTLE WARBLER (*Dendroica coronata*). Abundant winter visitor. Arrives in southern Louisiana about Oct. 15: Oct. 11, 1905, at Biloxi, Miss. Departs from the coast about April 22. Latest at New

Orleans, April 27, 1897 and 1903. More or less continuously abundant throughout some winters, but almost rare in occasional seasons. A decided transient movement is observable usually at the end of winter and in the early spring. In 1906, I noted increases at Biloxi, Miss., on the following dates: Jan. 6, 20, 29; Feb. 1; March 10, 19, 24. Specimens in very good plumage are seen as early as April 1, and singing usually begins at this time or a little earlier and continues until the time of departure. While the singing is not infrequent, it cannot be called general.

277. MAGNOLIA WARBLER (*Dendroica magnolia*). Abundant fall transient; decidedly rare in spring in localities where I have made observations. Earliest arrival in fall, Sept. 13, 1899, Bay St. Louis, Miss.; usually arrives about Sept. 20; common at Covington, La., Oct. 1, 1899. Latest date of departure, Oct. 28, 1899, Covington. Usually common until about Oct. 20. In spring this species is more apt to be seen in the latter part of the season: May 5, 1897, New Orleans; May 11, 1902, Bay St. Louis, Miss.

278. CERULEAN WARBLER (*Dendroica cerulea*). May breed in the northern part of the State, but apparently only a transient in most localities. Seldom common, though small companies may sometimes be seen for a period of a few days in the migrations. Commoner in the mixed upland woods than in the southeastern section. Migrates very early in fall: July 12, 1897, Beauvoir, Miss., where small flocks were seen on this and succeeding days in pine, oak, magnolia, beech and hickory woods. Latest date in fall, Sept. 30, 1897, Ariel, Miss. Arrives at Gulf coast latitude about April 10; earliest, April 8, 1898, New Orleans.

279. CHESTNUT-SIDED WARBLER (*Dendroica pensylvanica*). In the southeastern part of the State, this is one of the rarer transients, especially in spring. Most apt to be seen in the latter part of the season (April 21, 1905, New Orleans). Sometimes common for a few days in fall. Noted many near New Orleans on Oct. 10, 1896, during a remarkable wave of transients, principally warblers, tanagers, and vireos. The earliest date of arrival in fall is Sept. 12, 1899, Bay St. Louis, Miss., and the latest date in fall is Oct. 19, 1897, Ariel, Miss.

280. BAY-BREASTED WARBLER (*Dendroica castanea*). Occasionally present for a day or so in fall, occurring singly or in small flocks. Earliest date of arrival, Sept. 23, 1896, Bay St. Louis, Miss. Latest date in fall, Oct. 18, 1897, Ariel, Miss. In spring it is rarer than in fall. Have noted it the first week in May at New Orleans, and at New Iberia: May 15, 1902.

281. BLACK-POLL WARBLER (*Dendroica striata*). A decidedly rare transient, though occasionally occurring in considerable numbers for a day or so at a time. Mr. W. B. Allison noted a good many at Bay St. Louis, Miss., May 13, 1906. I noted one at New Orleans, Sept. 21, 1897.

282. BLACKBURNIAN WARBLER (*Dendroica fusca*). While never very common, this is a species of rather more regular occurrence in fall than the several preceding. It is considerably rarer in spring. The earliest date of

arrival is April 8, 1900, Bay St. Louis, Miss. A specimen was noted by Mr. Andrew Allison, and, in fact, taken, at Bay St. Louis, Miss. on August 11, 1898. The next earliest record of arrival is Sept. 13, 1897, Ariel, Miss. The latest date of departure is Oct. 18, 1901, Bay St. Louis, Miss. As with most other warblers of this group, this species occurs more freely in mixed upland woods than in the fertile alluvial region of southeastern Louisiana.

283. SYCAMORE WARBLER (*Dendroica dominica albilora*). Fairly common summer visitor, especially in brakes of tall cypress. Earliest arrival, Feb. 27, 1897, New Orleans. Usually arrives about March 10. Latest date of departure, Sept. 20, 1901, Bay St. Louis, Miss. Confined more or less closely to swampy woods in the breeding season.

284. BLACK-THROATED GREEN WARBLER (*Dendroica virens*). Fairly common in the lowlands during fall waves; common throughout much of the fall migration in pine and other upland growths. Rarer in all sections in spring. I took a specimen at Beauvoir, Miss., July 30, 1897, and I am sure of having seen it the latter part of July in Madison Parish! Excluding these abnormally early transients, the earliest date of arrival is Sept. 18, 1897, Ariel, Miss. It was common at New Orleans, Oct. 20, 1896, and became common at Biloxi, Miss., Oct. 22, 1906. The last was seen at Covington, Oct. 28, 1899. In spring it occurs chiefly in the latter part of the season: April 14, 1902, Bay St. Louis, Miss., and May 9, 1903, Lobdell, La.

285. PINE WARBLER (*Dendroica vigorsi*). Abundant resident in pine forests; elsewhere a winter visitor only. Individuals wintering in regions of deciduous woodland do not appear in such localities until the early part of the winter as a rule, and they do not remain much after the middle of March, at least in the southern part of the State. In the pine woods, this warbler begins to sing with the first mild weather of January.

286. PALM WARBLER (*Dendroica palmarum*). A fairly common winter visitor, sometimes rather abundant, in open places in the lowlands and in flat pineries. I have been unable to trace the relation between the movements of this species and the Yellow Palm Warbler (*Dendroica palmarum hypochrysea*), and have assumed all data to refer to the Palm Warbler. Arrives about the middle of October and becomes common about Nov. 1. Remains until the early part of April: April 11, 1896, New Orleans.

[PRAIRIE WARBLER (*Dendroica discolor*). Though undoubtedly occurring in localities in the piney sections of the State similar to those frequented by it in southern Mississippi, this species has not been recorded by any observer in Louisiana so far as I know. While it does not appear to breed on the coast of Mississippi, it arrives there by the latter part of July, and is rather common in scrubby growths of pine and oak. I have no data on its movements in southern Mississippi in spring, and no record of its departure in fall.]

287. OVENBIRD (*Seiurus aurocapillus*). Fairly common transient for brief and occasional periods, found chiefly in mixed woodland undergrowth,

especially in moist localities. Earliest arrival, April 5, 1902, Bay St. Louis, Miss. Usually commonest about April 15. Latest date in spring, May 9, 1903, Lobdell, La. Earliest arrival in fall, August 28, 1899, Bay St. Louis, Miss. Latest departure, October 19, 1897, Ariel, Miss.

288. WATER-THRUSH (*Seiurus noveboracensis noveboracensis*). In southeastern Louisiana, except in the pine woods, this species greatly outnumbers the following, which, in fact, is rather rare in the fertile alluvial section. In the pine woods the two species are about equally common in migration, the present species preferring the occasional sloughs and swampy strips among the pines, the Louisiana Water-Thrush frequenting sandy ravines and creek and small river banks, and on the Mississippi coast occurring even on the sandy shore. The Water-Thrush reaches Gulf coast latitude in fall the middle or latter part of August, remaining until Oct. 10 or 15 — latest, Oct. 17, 1896, New Orleans. In spring it arrives early in April, but is more apt to be common late in the season. Latest date of departure, May 7, 1897, New Orleans.

289. LOUISIANA WATER-THRUSH (*Seiurus motacilla*). Those sections of the State where the streams flow over sharp sandy beds are the preeminent habitat of this species, both as breeder and transient. As a breeder, it is found chiefly in the northern part of the State, but it reaches the latitude of the coast very early, having been noted at Bay St. Louis, Miss., July 4, 1906, and always commonly after the middle or latter part of July. As previously explained, it is not very common in the southeastern part of Louisiana; the earliest date of arrival in spring is March 19, 1904, at New Orleans. Records of the departure in fall are lacking.

290. KENTUCKY WARBLER (*Oporornis formosus*). Common summer visitor in undergrowth of flat, moist woods, such as the better drained swamps in the lowlands and the bottoms of the more elevated sections of the State. Arrives at Gulf coast latitude the last of March: earliest, March 26, 1905. Inconspicuous in fall; appears to leave about the end of September.

[CONNECTICUT WARBLER (*Oporornis agilis*). Has not been recorded yet for Louisiana. I noted either this species or the Mourning Warbler at Biloxi, Miss., on August 27, 1906.]

291. MOURNING WARBLER (*Oporornis philadelphia*). I have never found this bird in the State, but Mr. Andrew Allison noted what he was reasonably sure was a specimen of this species early in October, 1896, at New Orleans. I have noted either this species or the Connecticut Warbler at Biloxi, Miss. (August 27, 1906). In any event, it is a decidedly rare bird in all sections of both States.

292. MARYLAND YELLOW-THROAT (*Geothlypis trichas trichas*). Common winter visitor, all breeding birds being doubtless referable to the next form. At the Gulf coast, there is always a decided influx of Yellow-throats about Sept. 1, but whether this form alone is represented in this movement, I am unable to say.

293. FLORIDA YELLOW-THROAT (*Geothlypis trichas ignota*). An abundant resident in all suitable locations.

294. YELLOW-BREASTED CHAT (*Icteria virens virens*). Abundant summer visitor, at least in the lowlands, occurring in tangled growths in old fields, etc. More or less common in such situations throughout the State. Arrives about April 15. Earliest, April 11 — Lobdell, 1903; New Orleans, 1905. Usually becomes common April 20 or shortly after. Disappears more or less completely in the fall: Sept. 24, 1897, Ariel, Miss.: Sept. 26, 1898, Bay St. Louis, Miss. Appears to avoid the fertile alluvial lands of southeastern Louisiana entirely in fall.

295. HOODED WARBLER (*Wilsonia citrina*). Common summer visitor in all swampy localities, especially the southeastern section, where, in fact, it is extremely abundant. Arrives usually March 12–15. Earliest, March 8, 1896, and March 9, 1897. Becomes common about March 20. It should be observed, however, that these dates refer to the fertile alluvial section of the southeastern part of the State. In the river bottoms of the more elevated part of the State it is seldom seen before April. Remains at least until the latter part of October. Latest, Nov. 2, 1902, New Iberia, La.

[WILSON'S WARBLER (*Wilsonia pusilla pusilla*). Not yet recorded for Louisiana.]

[CANADIAN WARBLER (*Sylvania canadensis*). Although noted in southern Mississippi — Amite county: Ariel; Hancock county: Bay St. Louis — this species has never been noted in Louisiana by any of the observers with whom I have compared records.]

296. AMERICAN REDSTART (*Setophaga ruticilla*). Abundant fall transient in all sections, less common in spring, especially in the southeastern part of the State, where, on the whole, it is decidedly rare at this season. Possibly breeds in the northern part of the State. Returns from the north very early: July 30, 1897, Beauvoir, Miss.; July 21, 1899, Bay St. Louis, Miss.; Becomes common early in August. Latest date of departure, Oct. 27, 1899, Covington, La. Earliest in spring, April 1, 1899, Bay St. Louis, Miss.; latest, May 15, 1902, New Iberia, La.

297. AMERICAN PIPIT (*Anthus rubescens*). Common winter visitor in all suitable locations, especially abundant in the southeastern part of the State, occurring in great flocks on the plantations and other cleared land. Usually arrives shortly after Oct. 20; earliest, Oct. 19, Ellisville, Miss. Becomes common early in November. Remains common until April 15 or 20, and the last has been seen May 2 in southern Louisiana on several occasions.

298. SPRAGUE'S PIPIT (*Anthus spraguei*). Said to be rather common in winter in western Louisiana; rather uncommon and irregular in the southeastern part of the State. Earliest, Nov. 5, 1902, Lobdell; latest, April 19, 1902, New Orleans.

299. MOCKINGBIRD (*Mimus polyglottos polyglottos*). Uniformly abundant resident throughout the State.

300. CATBIRD (*Dumetella carolinensis*). Most abundant as a fall transient. Reaches the southern part of the State about Sept. 10, and

becomes abundant shortly after Sept. 20. Disappears more or less completely by the early part of November, though seen occasionally in winter near the coast. Transients appear near the coast the latter part of March, and continue present until about the middle of May. Breeds in the northern part of the State.

301. BROWN THRASHER (*Toxostoma rufum*). Rare as a breeder, fairly common in winter and common transient in the southern part of State. Common breeder in the central and northern parts. In migration in the southern part of the State, it occurs chiefly at the same time as the Catbird.

302. CAROLINA WREN (*Thryothorus ludovicianus ludovicianus*). Abundant resident in all wooded or shrubby localities except those within reach of the tide. Sings throughout the year, and nests from March to July.

303. BEWICK'S WREN (*Thryomanes bewicki bewicki*). Chiefly a winter visitor, but may breed occasionally north of the extreme southern part of the State. Movements rather irregular; sometimes seen rather early in the fall. Commoner in upland localities than in the coastal section even in winter. Begins singing in the latter part of the winter or early in the spring.

304. HOUSE WREN (*Troglodytes aëdon aëdon*). Common winter visitor. Reaches the coast the last week in September (earliest, Sept. 21, 1899, Bay St. Louis, Miss.). Leaves the southern part of the State about April 18; latest, April 23, 1898, New Orleans. Sings more or less freely for three weeks or more preceding its departure.

305. WINTER WREN (*Nannus hiemalis hiemalis*). Winter visitor; not very common at least in the southern part of the State. Earliest arrival in fall, Oct. 15, 1901, New Iberia. Departs in March.

306. SHORT-BILLED MARSH WREN (*Cistothorus stellaris*). Winter visitor, not common. Arrives Oct. 10–15; earliest, Oct. 8, 1905, Biloxi, Miss. Remains late: April 19, 1902, Bay St. Louis, Miss.; May 12, 1903, Lobdell, La. Found usually in wet weedy places.

307. LONG-BILLED MARSH WREN (*Telmatodytes palustris palustris*). Resident; abundant in the coast marshes, especially in summer. Usually found along the bayous and the more protected shores.

308. BROWN CREEPER (*Certhia familiaris americana*). Fairly common winter visitor, except in the coast section, where it is decidedly uncommon. The time of its arrival, however, is very regular, the first having been noted on three occasions in southern Louisiana on Oct. 14, and once on Oct. 15. The only date of departure recorded is March 18, 1902, Bay St. Louis, Miss.

309. WHITE-BREASTED NUTHATCH (*Sitta carolinensis carolinensis*). Resident in pineries and regions of mixed upland woods. Unknown in prairie and fertile alluvial regions. The Florida White-breasted Nuthatch is no doubt the regular breeding form in the more southern part of the State. Rather commoner in winter in most localities where it occurs.

[RED-BREASTED NUTHATCH (*Sitta canadensis*). While there is no record, so far as I know, of the occurrence of this species in Louisiana, it has been

noted by Mr. Andrew Allison in Mississippi (Bay St. Louis, April 1, 1902), and no doubt it occurs occasionally in Louisiana.]

310. BROWN-HEADED NUTHATCH (*Sitta pusilla*). Confined apparently to the pine flats and long-leafed pine hill regions, where it is an abundant resident.

311. TUFTED TITMOUSE (*Bæolophus bicolor*). Common resident in all wooded localities.

312. CAROLINA CHICKADEE (*Penthestes carolinensis carolinensis*). Common resident throughout the State. Starts nesting early in March in the southern part of the State.

313. GOLDEN-CROWNED KINGLET (*Regulus satrapa satrapa*). Common winter visitor, showing a decided preference for evergreen growths. In the fertile alluvial region of the southeastern part of the State it frequents live oaks almost exclusively. It arrives at Gulf coast latitude about Oct. 15–20. Latest date of departure, April 5, 1906, Biloxi, Miss.

314. RUBY-CROWNED KINGLET (*Regulus calendula calendula*). Common winter visitor in all mixed woods, as well as in groves and high shrubbery. Earliest date of arrival, Oct. 6, 1897, Ariel, Miss. Becomes common Oct. 20 or shortly after. Becomes very abundant with first cold weather in November. Usually departs about April 10. Latest date of departure, April 25, 1903, Lobdell. Sings rather freely for a few weeks before its departure.

315. BLUE-GRAY GNATCATCHER (*Polioptila cærulea cærulea*). Common summer visitor in all more or less wooded localities. May be noted occasionally in winter near the Gulf coast and I saw one at Shreveport, La., Feb. 23, 1915. First migrant usually seen March 12–15. Usually common March 20–22. Disappears more or less completely by the middle or latter part of August.

316. WOOD THRUSH (*Hylocichla mustelina*). Common summer visitor, though breeding only sparingly in the immediate vicinity of the coast, being found in close, moist woods, but never in the heavy swamps. Commonest as a fall transient, from about Sept. 15 to Oct. 15. Arrives the last week in March near the coast; earliest, March 25, 1900, Covington. Becomes common April 5–10. Latest date in fall, Oct. 19, 1897, Ariel, Miss. Prefers shady bottoms in the higher parts of the State.

317. VEERY (*Hylocichla fuscescens fuscescens*). Fairly common transient, frequenting mixed woodland generally. Spring migration performed chiefly between April 15 and May 15. May be heard in night migration almost to the end of May; latest, May 25, 1911. On June 4, 1907, I saw one of this species on Last Island, and noted that it was "obviously off its reckoning and showing signs of fear to the point of confused stupidity. It made short nervous flights among the "mangle" bushes (*Avicennia nitida*) and about the sand on the spit. Earliest date of arrival in fall, Sept. 7, 1900, Bay St. Louis, Miss.; latest date of departure, Oct. 24, 1914, New Orleans.

318. GRAY-CHEEKED THRUSH (*Hylocichla aliciæ aliciæ*). Common transient at times in spring, especially in the latter part of the season; less

common in fall, occurring chiefly in the early part of October. Recorded somewhat doubtfully at New Orleans, March 27, 1897; earliest authentic arrival, April 14, 1902, Bay St. Louis, Miss. Latest, May 9, 1903, Lobdell. Noted in remarkable abundance at New Orleans the first week in May, 1897, occurring in situations of practically every character, but seen mostly in weedy fields. Earliest arrival in fall, Sept. 22, 1897, Ariel, Miss.

319. OLIVE-BACKED THRUSH (*Hylocichla ustulata swainsoni*). Common transient, especially in fall. Earliest arrival in spring, April 5, 1903, Covington; latest in spring, May 4, 1897, New Orleans. Waves of this species, with Gray-cheeked Thrushes and Veeries, are most apt to be present shortly before and after May 1. Earliest arrival in fall, Sept. 12, 1897, Ariel, Miss. Usually becomes common about Sept. 22. Latest in fall, Oct. 31, 1900, Bay St. Louis, Miss.

320. HERMIT THRUSH (*Hylocichla guttata pallasi*). Common winter visitor. Earliest, Oct. 10, 1912, New Orleans; average arrival in southern Louisiana and Mississippi, Oct. 15. Latest date of departure, April 13, 1895, New Orleans. Usually leaves first week in April.

321. AMERICAN ROBIN (*Planesticus migratorius migratorius*). Numbers vary decidedly from year to year, especially in the coastal section. Earliest arrival, Oct. 9, 1897, Ariel, Miss.; earliest at New Orleans, Oct. 12, 1913. Average date of the first at the coast, Oct. 15. Usually becomes common with first cold weather in November. Few remain at coast latitude after March 15, and the last is usually seen the last week in March. Latest fully authenticated date of departure, April 4, 1906, Biloxi, Miss.

322. WHEATEAR (*Saxicola œnanthe*). The capture of a specimen in the outskirts of New Orleans, Sept. 12, 1888, is recorded by Prof. Geo. E. Beyer, in a list of the birds of Louisiana published in the "Proceedings of the Louisiana Society of Naturalists."

323. BLUEBIRD (*Sialia sialis sialis*). Common resident except in the fertile alluvial region of the southeastern section of the State, where it is commonest in winter and where its occurrence in the breeding season is limited principally to its presence in occasional colonies about the sugar plantations.

PHAËTHON CATESBYI BRANDT.

BY GREGORY M. MATHEWS.

INVESTIGATION of the forms of the family Phaëthontidæ for the purpose of my 'Birds of Australia' compelled the determination of the above name with the result that I find it must displace *Phaëthon americanus* Ogilvie-Grant. This latter name is accepted in the Amer. Ornith. Union's Check-List, 3d Ed., p. 59, 1910, so that I must give reasons for its rejection.

When Ogilvie-Grant monographed the family in the 'Catalogue of the Birds in the British Museum,' Vol. XXVI, he was enabled, through a recent discovery of Mr. C. D. Sherborn, to follow strictly the law of priority and displace the well-known *Phaëthon candidus*, by the hitherto unheard of *Phaëthon lepturus* of Lacepède and Daudin. He was also able to indicate that *Phaëthon flavirostris* Brandt had been misapplied to the American bird, which differed from the Mauritius species, of which Brandt's name became a synonym. For the American species, he therefore proposed *Phaëthon americanus* and this name has been admitted for seventeen years.

This provides another of those strange anomalies which have been constantly noted by myself while engaged in the determination of Australian birds. I refer to the acceptance of names utilised in the 'Catalogue of the Birds in the British Museum' by American ornithologists when a very little investigation would have proved their inapplicability. In the 'Catalogue of Birds of the British Museum,' Vol. XXVI, p. 456, 1898, where *Phaëthon americanus* is catalogued the very first reference reads:

"Tropick Bird, Catesb. Car. II App. pl. 14 (1743) (Bermuda; Porto Rico)."

The following is the gist of the account there given: "Mr. Willughby's description. . . .differs somewhat from ours, which was made from the living Bird. The legs in his, by long keeping, had lost their red colour, which all that I have seen, while living, have. This Bird is about the size of a Partridge, and has very long wings.

The bill is red, with an angle under the lower mandible like those of the Gull kind, of which it is a species. The eyes are encompassed with black, which ends in a point towards the back of the head. Three or four of the larger quill feathers, towards their ends, are black, tipt with white; all the rest of the Bird is white, except the back which is variegated with curved lines of black. The legs and feet are of a vermilion red. The toes are webbed. The tail consists of two long straight narrow feathers, almost of equal breadth from their quills to their points. These Birds are rarely seen but between the Tropicks, at the remotest distance from land....yet one of their breeding-places is almost nine degrees from the northern Tropick, viz. at Bermudas, where from the high rocks that environ those Islands, I have shot them at the time of their breeding....they breed also in great numbers on some little Islands at the east end of Porto Rico."

For the time when this article was written, 1743, this is a most accurate and complete description of the Bermuda bird, and the figure given is a splendid one of the species known as the Yellow-billed Tropic-bird.

As a synonym of *Phaëthon æthereus*, Ogilvie-Grant ranged:

"*Phaëton catesbyi*, Brandt, Mem. Acad. St. Petersb. (6) v, pt. II, p. 270 (1840) (Bermuda: Rico)."

I trace this determination through Gray (Handl. Gen. Sp. Birds, pt. III, p. 124, 1871) to Bonaparte (Consp. Gen. Av. II, p. 183, 1857). Reference, however, to Brandt's paper shows that he gave this name to the "Avis Tropicorum, Catesby, Nat. Hist. of Carol I., II. Ed. Edwards, p. 114, t. 14." This is simply a reprint of the account given by Catesby as quoted above, with the same plate reproduced.

If Catesby's name be applicable to *Phaëthon americanus* Grant then Brandt's name must be and it has 57 years' priority. In Catesby's description three debatable points may be noticed. First, the bill is given as red. This species is known as the Yellow-billed Tropic Bird and in the 'Water Birds of North America,' Vol. II, p. 186, 1884, the bill is described as deep chrome or wax yellow and a footnote reads: "Audubon describes the bill of the male as "orange-red," and that of the female as yellow: but he

seems to have had *P. aëthereus* in mind in the former case, though his description otherwise applies exclusively to *P. flavirostris*."

In 'The Ibis,' 1914, Karl Plath has written about the Bermuda *Phaëthon* and on p. 554 observes: "I had noticed that the birds flying about seemed to have orange red bills rather than the yellow to which they owe their name, and this bird certainly had a red bill. I called the attention of my companion to it, and we agreed that it could be best described as bright orange-red, inclining to vermilion on the upper ridge."

This confirms the accuracy of Catesby's observation with regard to the bill-colouration, but Karl Plath's legs and feet colouration does not coincide with that given by Catesby. The other points are the omission of the black band along the wing and the scapular colouration while the back is said to be variegated with curved lines of black. The figure given shows these black lines to be practically coincident with the black scapulars while if the figured or described bird were slightly immature it might show black lines on the back. The description as a whole is quite inapplicable to *P. aëthereus* and seems quite good enough for acceptance. As far as I can trace only one species of *Phaëthon* breeds at Bermuda where Catesby procured specimens himself. I designate Bermuda as the type-locality of *Phaëthon catesbyi* Brandt and recommend its usage for the American Tropic Bird, known as the Yellow-billed Tropic Bird. As this is a misnomer, why not replace it by "Catesby's Tropic Bird" and thus honour the writer of one of the most interesting books on American natural history?

I would remark that for the small Tropic Birds I use the generic name *Leptophaëthon* which I introduced in the 'Austral Avian Record,' Vol. II, p. 56, 1913, with type *Phaëthon lepturus* Daudin. These have only twelve tail-feathers as against the fourteen of *P. aëthereus* or the sixteen of *P. rubricauda*. They are smaller, more delicately formed birds and the tail is of a different nature. The elongated central tail-feathers have comparatively wide webs, and the tail otherwise is strongly wedge-shaped, the two feathers adjacent to the central ones being twice as long as the outside feathers.

To be consistent with their general usage as regards genera American ornithologists must accept my genus *Leptophaëthon*.

SIMULTANEOUS ACTION OF BIRDS: A SUGGESTION.

BY WINSOR M. TYLER, M. D.

THE House Sparrow (*Passer domesticus*) affords a good example of a habit common among Fringilline birds when gathered in flocks, the habit of all starting up as one bird from their feeding ground and returning almost immediately from perches near by, singly or a few birds at a time. On any day between November and March, in town centres where House Sparrows congregate, large numbers of these birds may be watched going through this interesting manœuvre.

At sunrise on the morning of December 29, 1912, more than a hundred Sparrows were feeding in the snow-covered street which passes through the centre of Lexington, Mass. Over the space of an acre or two, the birds were collected in half a dozen flocks at points in the street where food was plenty. Although busy filling their crops after a fifteen-hour fast, they remained on the ground scarcely a full minute at a time; without apparent reason, and with no warning note that I could detect, a flock whirred away into the elm branches overhead and within a few seconds the birds began gradually to re-assemble at the place they had just left. Other flocks did precisely the same thing. The instant departure of a large flock is impressive; there is no frightened start of one bird, the others trailing on behind; the birds rise with the suddenness of a rifle's crack.

The birds fly back and forth between the street and some near cover so frequently that they spend perhaps no more than two-thirds of the time in feeding. When they rise in a body it happens rarely that one or two birds do not leave with the others, but feed on, undisturbed by the precipitous flight of the majority. Individual action is occasionally shown also by a single bird, who flies off to join another flock. This flying off of one of their number has apparently no effect on the remainder. Individual action, although occurring in members of a flock of feeding Sparrows, is the exception; as a rule the flock moves as a unit.

As one watches the Sparrows leave their feeding ground time

after time, apparently without cause, but of their accord, one cannot help believing that some purpose, perhaps unknown to the birds themselves, underlies these interruptions. But more mysterious than the purpose of these sudden risings, is the means by which a large number of Sparrows decide, with the unanimity of a single bird, to fly up.

One's first thought is that the birds in a flock start in response to a note of warning given by one of their number. It is not necessary to suppose a leader; any bird perceiving danger, or fancying that he perceives it, might sound a warning which would arouse his companions to retreat. That a man, even although he stands very near a flock of birds, seldom, if ever, hears an alarm note,— or indeed any note at all,— is no proof of the absence of a signal. However, one feels a little skeptical when he considers the almost incredibly rapid response to a hypothetical signal inaudible to human ears. I believe also that the Sparrows themselves give more positive indication that in their concerted actions they do not, or need not, depend on signals. It is a common habit of the House Sparrow when gathered together, often in large companies, to chatter or scold. Each bird repeats for minutes at a time his "chape" or "chillip" note, adding his voice to the din of the chorus. These choruses often end on the instant. No orchestra leader could more quickly silence the instruments under his control on one beat, yet, in the case of the Sparrow, it is unbelievable that an alarm note could be heard above the general uproar.

There is another point which counts against the practicability of a signal. It is chiefly when large numbers of Sparrows are assembled in a flock that the sudden uprisings are conspicuous. One might almost say that the unanimity was directly in proportion to the number of birds present. That this proportion would *appear* to hold is self evident,— for the larger the rising flock, the greater the impression on the eye; but a little observation will show that a small flock of Sparrows acts in a very different way. A small flock of House Sparrows will generally remain feeding in the street until they are frightened away, and then they will leave the feeding ground severally, a few birds at a time. Those nearest the approaching danger, or the most timid, start first, to be followed successively by the remainder. Here are the very conditions under

which a signal could best be heard,— very few birds make up the flock and all could hear the signal, but instead of simultaneous action there is individual alarm.

It is possible that fear may be communicated throughout a large flock by any one of their number starting up in alarm, but that this explanation is always, or even often, responsible for the uprisings is improbable on account of the regularity of the retreats to cover.

The behavior of the individuals composing a flock of Sparrows, as opposed to their movements "en masse" is well seen if one slowly approaches a flock at rest in shrubbery. Now, the birds gradually withdraw; each bird as he feels himself in danger, retreats. He at first hops deeper into the bushes and later, perhaps, flies. One bolder than the others, may remain alone near the danger even after the others have flown. Under these circumstances the birds act just as one would expect any company of individuals to act at the approach of danger; — when threatened each individual seeks safety. It is true that in the movements as a body, each individual may be seeking safety, but here there is a difference; each bird in a large flock starts at the same instant and, until perched, acts exactly as his companions do. It is possible that sometimes the birds are really frightened away, but, in that case, they act as if they all perceived the danger and reacted to it as a unit. This instant response is clearly distinct from the straggling retreat from a passing carriage.

I was interested to note, some time ago, the behavior of a large flock of birds collected in an open field with no cover near. Although the birds were not House Sparrows, they belonged to species in which the habit under consideration is well marked. The note indicates that the proximity of shelter, which might act as a stimulus to retreat, is not responsible for the interruptions while feeding. "Feb. 7, 1911. Twenty Goldfinches and more than twice as many Redpolls are feeding on the snow upon weed-seeds. This large flock of nearly a hundred birds is spread out over half an acre of meadow land where the weed stalks, sticking thickly through the snow, afford abundant food. In spite of the plentiful supply of food, the birds are restless and keep starting up and alighting at once near by, but there is not, as noted previously, a general movement of the flock in one direction; the flock as a whole is stationary.

Also, until I make the birds apprehensive by coming near them, there is no flying off to cover and back as I have noted in Juncos and Tree Sparrows. However, in this case there is no cover near." These birds showed the same uneasiness, the same tendency to fly in numbers from their feeding ground as noted in the House Sparrow, but here, with no cover to retreat to, they merely started into the air and at once settled quietly among the weeds.

When House Sparrows and certain other birds of similar feeding habits are assembled in flocks, they may act in two ways,— individually and as a unit. When they act individually, we understand their behavior well enough; they act much as we should under the same circumstances; they are quite human. But when we see a hundred birds acting as one, and watch them as, without warning, they start on the instant and whir away like leaves in a gust of wind, we must needs believe that some superhuman force is at work among them. Can it be that, for a time, each of the hundred little brains forms a part of a common mind which, ever watchful for danger, only recognises it in the abstract and periodically drives the flock to seek shelter? This hypothesis is consistent with the facts; it would explain otherwise meaningless interruptions of feeding as well as the instantaneous flights, without signal, of busily occupied birds.

If such is the case,— if a subconsciousness of danger hangs over each large flock while feeding,— the birds are, or seem to be, uninfluenced by it and unaware of it until, like an explosion, it throws them all into the air; as if the common mind governed a single body instead of a hundred.

In addition to the sudden risings from their feeding grounds, birds often display unanimity of behavior on other occasions. The simultaneous action of birds in rapid motion is well illustrated by closely-packed companies of flying Sandpipers. Each bird, when the flock changes its direction, escapes collision with its neighbors by turning at the same moment, in its tracks, so to speak. If a flock of Sandpipers changed its direction as a train of cars rounds a curve (each car swinging to one side only when it reaches the curved portion of the track) simultaneous action in the birds would not be required; each bird in that case would *follow the example* of the bird immediately in front of him. Flocks of Sandpipers, however, do not wheel in this way, or they do not always do so. Any

one can satisfy himself on this point by watching a flock of *Ereunetes pusillus*, for example, flying past in bright sunlight. At first, if you are between the sun and the birds, their white underparts shine out as the light strikes under the raised wing; later, in the distance, the birds appear as a group of flickering bright spots,— until the flock turns. Then, in an instant, every bird disappears; each has turned away at the same moment and presents to the eye only the narrow edge of the wings and the smallest diameter of the body,— invisible in the distance.

One advantage of maintaining a food-shelf is that the birds which visit it, after they have fed, often remain near and afford excellent opportunities for study at close range, while the birds are entirely at ease and wholly unconscious of being observed. At such times they sometimes display traits and habits which under other circumstances, even after long acquaintance, they will not have shown. For example, in the winter, after a little band of Chickadees have satisfied their hunger at my food-shelf, they often spend half an hour or so in the shrubbery and arbor-vitæ trees eight or ten feet from the window. As a rule, they call cheerily to each other; sometimes, however, there comes a sudden hush,— every bird has become silent and perfectly motionless. For minute after minute, by the watch, the birds hold their quiet, and seemingly rigid, attitudes. I have timed them thus for eight minutes. It is difficult to find them as they sit as if frozen to the twigs; they are perched here and there, widely separated, some half-hidden in the evergreens, others exposed on bare branches. At last the stiff pose gradually gives way; one bird begins to move his head,— to look about a little from side to side. Every other bird is acting in the same way; now all are hitching slightly on their perches, some of them uttering their conversational notes in an undertone; now one or two give a rapid jingling call and hop from their perches; the spell is broken; the frozen statues are once again living, active, wide-awake Chickadees.

The point of especial interest here is the identical behavior of the birds,— their prolonged immobility, their silence, their quick passage from death-like stillness to activity. Although, to be sure, the transition occupies several seconds, the birds pass through it simultaneously (as nearly as the eye can follow their movements)

and not one after another. Naturally the commencement of the stillness is rarely observed,— I can only say that it takes place quickly,— but the period of immobility and the liberation from it I have seen often. Not a bird moves until the spell is broken, and when the release comes, it comes at once to every bird.

These Chickadees, very likely, are resting while they digest their recent meal, but that the necessity for rest should come to each bird at the same instant and persist for exactly the same time implies something more than chance; it suggests a relationship between the members of the flock, similar to that which, binding together a flock of Sparrows, enables them to start into the air in a body. The life of a bird is made up of cycles; in the great yearly cycle, which includes the breeding period and moult, preceded and followed by migration, birds over wide areas of country act (owing probably to physiological reasons) in fairly close unison. But how much closer must be the relationship between the members of a flock of birds in the daily cycle, during the winter months, when, with sexual jealousies dormant, they roam about amicably in search of food! Is it not possible that the need of food, the desirability of rest and the necessity for a safe night's shelter is perceived by the flock as a whole; that, acting as a unit, the sum of the intelligence of all the members of a flock keeps the company together, provides it with food and maintains a continuous watch for danger?

Psychologists recognize in the human race a subconscious power of thought-transference which, although proved beyond a doubt to exist, is rendered uncertain and made difficult to study because it is obscured and held in check by our "objective" mind,— our every-day, reasoning, thinking mind. This psychical power, telepathy, is defined as "the conveyance of thought or feelings from mind to mind by other than ordinary channels of sense." (Encyclopædia Britannica, 11th Ed., Vol. XXVI, p. 546).

When we realize that in animals the objective mind,— the barrier to telepathic action,— is, compared to our minds, slightly developed, is it not only possible, but even probable that birds possess greater telepathic power than man (to an extent inversely proportional, perhaps, to the development of their respective reasoning — objective — minds) and that this telepathic power is responsible for their concerted actions?

THE OLD NEW ENGLAND BOB-WHITE.

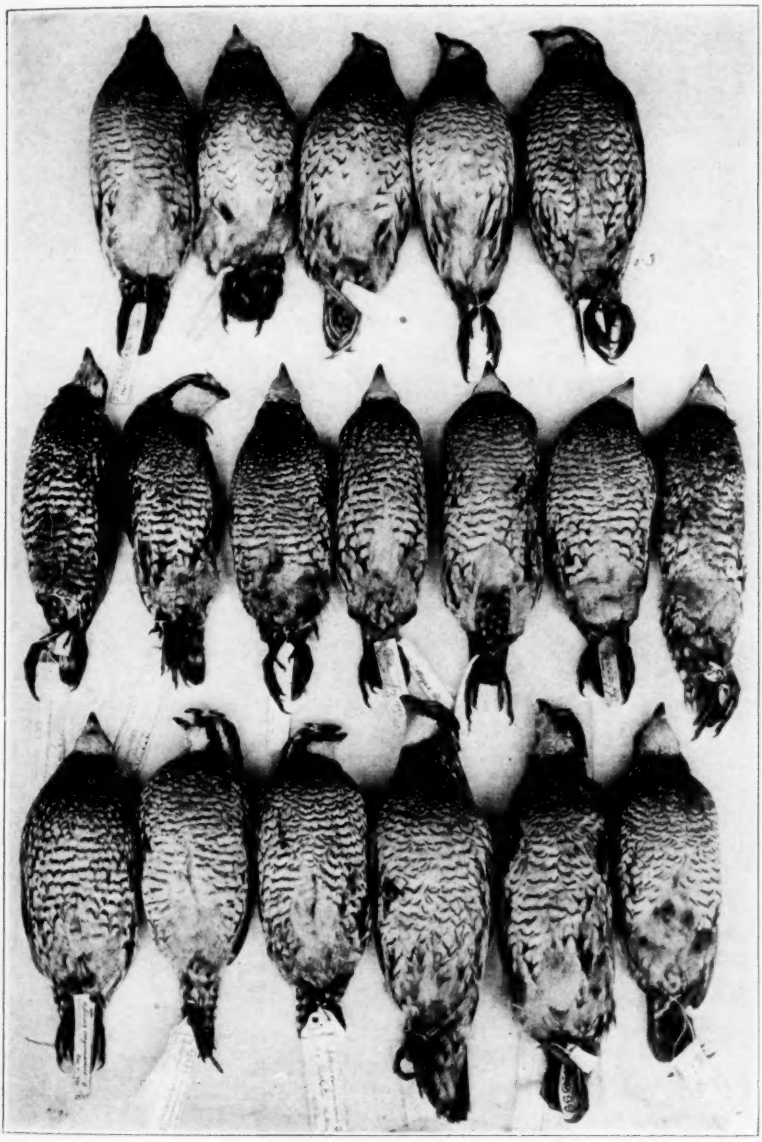
BY JOHN C. PHILLIPS.

Plate XVI.

IT has long been remarked both by ornithologists and sportsmen that the Bob-whites of New England and the north central states were somewhat larger than those of the Mid-Atlantic states. The name *Colinus virginianus* was given to the bird by Linnæus, based entirely on Catesby's material, so that the type locality may be fairly placed at South Carolina, probably near the Georgia line, for Catesby's bird collecting was done on the Savanah River. Catesby's plate represents a distinctly dark bird.

The question of a northern form is however somewhat complicated by the zealous efforts of sportsmen in transplanting Bob-whites from more favored to less favored regions, a process which has resulted in the entire or partial replacement of the native stock over most of its northeastward extension. It is interesting to note here that the subject of quail transplants was not thoroughly aired in sportsman's journals before the late seventies. By 1880 quail were advertised from various southern localities, Tennessee, Indian Territory, Texas, etc., at the extremely low figure of $2.00 a dozen. Between 1880 and 1885 there was great activity along this line and large transplants were effected in southern Vermont and in Massachusetts and probably over the whole of southern New England. Many references to this can be found in the files of 'Forest and Stream' between 1876 and 1885.

It appears however that the traffic in live quail existed a good while before this period for I have a record given to me by Mr. G. A. Peabody, of Danvers, for March, 1870, at which time 184 birds were let out in Essex Co., Mass. They were sent from Greensboro, N. C., but whether actually trapped there is of course uncertain. Mr. Peabody himself kept a few quail in a pen in the sixties and liberated a few at Danvers, Mass. He is certain that other sportsmen were doing the same thing about this time and he says that the planting was done with the utmost secrecy, which may account for the late appearance of reports of these transplants in the journals of the time. It is a fact that on Cape Cod quail were planted very early, for Mr. Peabody informs me that Mr.



BOB-WHITE (*Colinus virginianus*).

Row 1. Old New England Birds.
Row 2. Birds from Southern States (two on left = *C. v. floridanus*).
Row 3. Birds from Illinois, Indian Territory, etc.

Storey Fay brought many quail from his place near Savannah, Ga., and liberated them on the Cape (Falmouth?) in the late fifties. It is well known that at least some of the quail of Cape Cod are small and dark colored, and three male specimens taken at Wareham, Mass. (Bangs Coll. Nos. 4196, 1059, and 3347) between 1882 and 1901 are very heavily barred on the flanks and breast, like birds from Georgia and So. Carolina. On the other hand two specimens from the same collection and locality, nos. 1060 and 11492 are typical northern birds and these bear the dates 1882 and 1904. On measuring these skins I find that the three dark males from Wareham have a wing average of only 110 mm., while the two normal females from the same place average 114.5 mm. In other words there is evidence that the native and imported birds may have existed side by side and kept their identity, for a time at least.

In Mr. Brewster's collection there are some fine specimens taken near Boston between 1871 and 1891. These show no trace of imported blood. The largest specimen has a wing of 120 mm., being far larger than any of the specimens in the collection of the Museum of Comparative Zoölogy, either from New England, the Atlantic States, or the Dakota-Missouri region. In measuring these skins I divided them into three regions: 1st, Old New England, 2nd, Virginia to So. Carolina, 3rd, the western area, including Indian Territory, So. Dakota, Kansas and Missouri, 4th, a series from the Thayer museum at Lancaster representing Maryland, Virginia, and localities near Washington, and lastly another lot from the same collection taken at Sing Sing, New York.

	♂					♀				
	Cul.	Tarsus	Wing	Tail	No. spec.	Cul.	Tarsus	Wing	Tail	No. spec.
Old New England	15.8	31	113.7	57	9	14.6	30.6	113	55.6	6
Sing Sing, N. Y.	15.6	31.6	109	55.4	5					
Md. & Va.	16	31.3	111	57	9					
So. Atlantic	15.3	30.1	109.8	53.3	6	15	29	109	52.7	4
Western	15.7	30.7	110.4	57.3	12	15.4	30	109	55.3	10
Mt. Pleasant, S.C.	15.5	31	107.5	53	2	15.5	30	111	56.5	2

Two ♂♂ and two ♀♀ from Mt. Pleasant, S. C., near the type locality are added.

The old New England series is limited to birds collected near Boston in the seventies, mostly in Mr. Brewster's collection, and I am assured that the localities Belmont, Concord, and Brookline, where this series was taken, were not affected by southern quail. The wing measurement is large in both male and female, but the other measurements do not show much size difference. Probably in the flesh the birds were larger and heavier. One of these specimens has a wing of 120 mm., which is maximum for all the quail examined for the combined localities.

The South Atlantic series measures slightly less in both sexes than any other group, but the difference is surprisingly small. The Maryland and Virginia series are pretty well up to the New England standard and taken altogether the regions show far less difference than I had been led to expect.

Now the matter of coloring is not so easily settled as the size question. The spring plumage of Bob-whites is much grayer than the fall plumage, especially on the lower back and rump. The typical and extreme Massachusetts birds have a very light buffy appearance, the top of the head has very little black and the mantle is apt to be plain colored. There is a marked tendency to a more delicate barring on the under parts, and to an absence of barring on the lower breast and abdomen. In females the barring is much less heavy. In typical specimens of New England birds the barring is by no means transverse as in Georgia and South Carolina specimens, but very distinctly V-shaped, the pattern drawing out more and more to a sharp point on the lower flanks. It must be noticed, however, that our series shows no constant color difference between North and South Atlantic birds till one reaches at least the vicinity of Charleston, where specimens show a distinctly heavier and more transverse barring over breast and abdomen. Also the backs, scapulars, and tertials are darker in southern birds as well as the whole top of the head. There is no way that I can see of telling western from New England birds, while the Sing Sing, N. Y., series is identical with the Maryland series. Variation is very considerable, especially in the width of the barring on the lower parts, and in the extent of the barring on the abdomen. There is one

very darkly barred bird from Indian Territory and another from Vermilion, S. D.

In the plate I have arranged male birds in the following order: top row, old New England birds, typical ones on left, darkest individual on right. Second row; from right to left, Va., N. C., S. C. and Ga., with two typical Florida birds, *Colinus v. floridanus* at the left end. The lower row shows a series of western birds, with Illinois birds on the right and a darker Indian Territory bird on the left. The Georgia, Florida and Indian Territory specimens can always be told from those of New England, and the typical old New England bird can with fair certainty be separated from the southwestern bird, but not from that of Virginia.

To sum up: if I were asked to characterize the probable appearance of the New England quail of fifty years ago, I should say — Size large, especially the wing; mantle with a tendency to a plainer appearance and not so heavily speckled. Lower parts less heavily barred, and barring more V-shaped; whole top of head and postocular streak more reddish and less black: entire bird more tawny and generally somewhat lighter in tone, especially on the lower back, rump and sides.

EARLY RECORDS OF THE WILD TURKEY. IV.

BY ALBERT HAZEN WRIGHT.

(*Continued from p. 81.*)

The Carolinas and *Georgia.*

IN the seventeenth century, we have seven or eight notes of interest. In 1663, a "Report of Commissioners sent from Barbodes to Explore the River Cape Fear" has it that[1] "The woods (are) stored everywhere with great numbers of deer and turkeys — we never going on shore but we saw of each sort." Several excerpts from "A Relation of A Discovery lately made on the Coast of

[1] Hawks, Francis L. History of North Carolina, 1663–1729, Vol. II, p. 31.

Florida,—London, 1664" by William Hilton pertain to this species. In Port Royal Land,[1] "the woods (abounds) with .... Turkeys,....." Along Cape Fear River, "we proceeded down to a place....which we called *Turkie-Quarters,* because we killed several Turkies thereabouts." "In that time as our business called us up and down the River and Branches, we killed of wild fowl, four Swans,....ten Turkies,....." In "A Brief Description of the Province of Carolina, London, 1666" we find that[2] "The Woods are stored with Deer and Wild Turkeys, of a great magnitude, weighing many times above 50 l. apiece of more tast than in *England,* being in their proper climate."

In "Mr. Carteret's Relation of their Planting at Ashley River 1670" occurs[3] "Here is alsoe wilde Turke which the Indian brought but is not soe pleasant to eate of as the tame, but very fleshy and farr bigger." In 1674, Henry Woodward's "A Faithfull Relation of My Westoe Voiage" appears. While in Carolina, he supped[4] "w*th* two fatt Turkeys to helpe w*th* parcht corne flower broth." In another instance, "he carried along a fat Turkey for his better accommodation at night." In 1682, we have two notes: one by T. Ashe and the other by Samuel Wilson. The former finds the[5] "Birds for Food, and pleasure of Game, are....: In winter huge flights of Wild Turkies, oftentimes weighing from twenty, thirty to forty pound." The latter records, "Here are also in the woods, great plenty of Wild Turkeys,....." The last note of the century is by Richard Blome (l. c., p. 156). "Their woods and Fields (are) likewise stored with great plenty of *wild Turkeys,*....whose flesh is delicate Meat."

The first note of the next century occurs in the "Journal of John Barnwell." When 15 miles above Bathtown, he interprets the turkey's presence as sure evidence that the enemy did not expect them.[6]

Three years later (1714), the celebrated Lawson publishes his "History of Carolina." On a "Thousand Miles Travel among

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[1] Force, P. Vol. IV, pp. 8, 10, 11, 15.
[2] Carroll, B. R. Hist. Colls. of S. C. New York, 1836, Vol. II, p. 12.
[3] Narratives of Early Carolina, 1650–1708. New York, 1911, p. 119.
[4] ibid., p. 131.
[5] Carroll, B. R. l. c., Vol. II, pp. 73, 28.
[6] Va. Mag., Vol. V, No. 4, p. 401; Vol. VI, No. I, p. 44.

the Indians from South to North Carolina" he several times notes the turkey. Near Charlestown,[1] "when we approached nearer the place, we found it to be some Sewee Indians firing the cane swamps which drives out the game, then taking their particular stands, kill great quantities of both bear, deer, turkies....." Near Santee River, "The Indians killed fifteen turkeys, this day, there coming out of the swamp, about sun rising, flocks of these fowl, containing several hundred in a gang, who feed upon the acorns, it being most oak that grow in these woods. Early the next morning.... our guide killed more turkeys. Some of the turkeys which we eat whilst we staied there, I believe weighed no less than forty pounds. At night we killed a possum, being cloy'd with turkey....." Later, "our fat turkeys began to be loathsome to us." "At night we lay by a swift current (Sapona), where we saw plenty of turkeys, but perched upon such lofty oaks that our guns would not kill them, though we shot very often, and our guns were very good. Some of our company shot several times at one turkey before he would fly away, the pieces being loaded with large goose shot." Concerning these oaks he speaks at greater length under his account of the wild pigeons. The note follows: "pigeons come down in quest of a small sort of acorns, which in those parts are plentifully found. They are the same we call turkey acorns, because the wild turkies feed very much thereon; and for the same reason those trees that bear them are called turkey oaks."[2]

In "A Letter from South Carolina, etc. Written by a Swiss Gentleman to his Friend at Bern. 2nd edit. London, 1732" we find (p. 13) that "There are tame Fowls of all sorts, and great Variety of wild Fowl, as Turkeys,....." "An Extract of the Journal of Mr. Commissary *Von Reck* Who conducted the First Transport of Saltzburgers to Georgia: London 1734" says[3] "Night overtaking us, we were ob'iged to take up our Quarters upon a little Hill, and a Fire with the *Indians*, who brought us a wild Turkey for our supper." About Ebenezer, Savannah River, it holds that[3] "As to

[1] Lawson, John. The History of Carolina, London, 1714. Reprint Raleigh, N. C., 1860, pp. 25, 50, 51, 79, 92, 231–233.

[2] In 1737, John Brickell in his "The Natural History of North Carolina....." (Dublin, 1737, pp. 181–183) practically repeats the substance of Lawson's accounts.

[3] Force, P. Vol. IV, pp. 12, 13, 36.

Game, here are....Wild Turkies,....." "A New and Accurate Account of the Provinces of South Carolina and Georgia, London, 1733" states that [1] "our people that live in the country plantations procure of them (Carolina Indians) the whole deer's flesh; and they bring it many miles for the value of six pence sterling, and a wild turkey of forty pound weight for the value of two-pence." "A Young Gentleman" in "A New Voyage to Georgia 2nd edit. London, 1737" says [2] "I met with....plenty of wild turkeys,....." "An Account Showing the Progress of the Colony of Georgia in America, London, 1741" finds [2] "in the winter season (Savannah River) there is a variety of wild fowl, especially turkeys, some of them weighing thirty pounds,....." "An Impartial Inquiry into the State and Utility of the Province of Georgia, 1741" records that [3] "Mr. Harris, who is an expert fowler, sometimes goes out with his gun, and seldom fails of bringing in either wild turkey....or geese....." "A Description of Georgia London 1741" states that [4] "There is great plenty of wild fowl, particularly turkies,....."

In 1761, we have "A Description of South Carolina London." According to it,[5] "the sorts of wild fowl that frequent the inland parts of the Country, are Turkeys,....." In 1763, G. Milligen writes "A Short Description of the Province of South Carolina: London, 1770." It states that [6] "In the woods and fields are plenty of wild turkeys, of a large size,....." "The History of North America London, 1776" claims (p. 225) Georgia affords "wild turkeys from 20 to 30 pounds weight." Hewatt in 1779 merely mentions wild turkeys are in great numbers.[7] In 1784, J. F. D. Smyth (l. c., Vol. I, p. 149) reports that in North Carolina" "There are also....multitudes of....wild turkies....." Following him, we have Wm. Bartram. When at Broad River, he remarks (l. c., p. 45) "We at length happily accomplished our live, bringing in plenty of venison and turkeys, we had a plentiful feast at supper."

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[1] Colls. Ga. Hist. Soc. Savannah, 1840, p. 55.
[2] ibid., Vol. II, Savannah, 1842, pp. 51, 58, 314.
[3] ibid., Vol. I, p. 199.
[4] Force, P. Vol. II, p. 4.
[5] Carroll, B. R. Vol. II, p. 250.
[6] ibid., Vol. II, p. 482.
[7] Hewatt, Alex. An Hist. Account of South Carolina and Georgia. London, 1779, Vol. I, p. 85.

John Davis,[1] at the end of the century, tells how they used "to penetrate the woods in search of wild turkies" at Coosawhatchie.

In the nineteenth century, we have few notes. Gurney, in speaking of North Carolina, notes that [2] "The elegant forms of the wild turkeys on the full run, were sometimes seen gliding through the forest" and at Savannah he notices that "Among the birds, the wild turkey is common." The following year, 1842, Buckingham finds [3] "Wild turkeys and wild ducks are in sufficient abundance to furnish game for food."

Florida.

Several of the early 16th century notes pertain to Florida. In the next century, the historical literature of the turkey is scant. In "Virginia richly valued, By the description of the mainland of Florida, her next neighbour.... London 1609" we find [4] "There be many wild Hennes as big as Turkies....." "In a Relation of the Invasion and Conquest of Florida,.... London, 1686" we have "The Poultry are wild there, as big as Peacocks, and very plentiful."

In the eighteenth century, the roll of records is longer. The first author who mentions it is Wm. Stork who in 1766, writes that [5] "In the woods are plenty of wild turkeys, which are better tasted, as well as larger, than our tame ones in England." When in Florida, John Bartram 1766 records the wild turkey.[6] In 1770, J. H. Wynne practically repeats Stork's statement. "The History of North America London 1776" has it (p. 251) that "With regard to the winged species, here are vast numbers of turkeys,....." In 1791 we have the extended notes of Wm. Bartram. Of St. Ille, south of Alatamaha 60 miles, he says [7] "Turkeys....are here to be

[1] Davis, John. Travels of Four and a Half in the United States of America; — London, 1803. N. Y., 1909 edition, p. 112.
[2] Gurney, J. J. A Journey in North America ..... Norwich, 1841, pp. 62, 372.
[3] Buckingham, J. S. The Slave States of America. London, 1842. Vol. I, p. 156.
[4] Force, P. Vol. IV, p. 131.
[5] Stork, William. An Account of East Florida ..... London, 1766, p. 51.
[6] Bartram, John. A Journal kept .... for the Floridas; Jan. 14, 1766, p. 18. In Stork, vide supra, 3rd edit., London, 1769.
[7] Bartram, Wm. Travels, pp. 18, 101, 109, 110, 179, 189, 199, 201, 235, 348, 455.

seen; but birds are not numerous in desert forests; they draw near to the habitations of men, as I have constantly observed in all my travels." Of an island in Lake George, San Juan River, he writes "There are no habitations at present on the island, but a great number of deer, turkeys,.... and turkeys are made extremely fat and delicious from their feeding on the sweet acorns of the Live Oak." Along the San Juan River, "I, observing a flock of turkeys at some distance, on the other, (way) directed my steps towards them, and with great caution, got near them; when singling out a large cock, and being just on the point of firing, I observed that several young cocks were affrighted, and, in their language, warned the rest to be on their guard, against an enemy, whom I plainly perceived was industriously making his subtle approaches towards them, behind the fallen trunk of a tree, about twenty yards from me. This cunning fellow hunter was a large fat wild cat (lynx) he saw me, and at times seemed to watch my motions, as if determined to seize the delicious prey before me. Upon which I changed my object, and levelled my piece at him. At that instant, my companion, at a distance, also discharged his piece at the deer, the report of which alarmed the flock of turkeys and my fellow hunter, the cat, sprang over the log and trotted off." At Halfway Pond (Cuscowilla) "flocks of turkeys (were) walking in the groves around us,....." On Alachua savanna, he records "flocks of turkeys" and near old Alachua town "on our rout near a long projected point of the coast, we observed a large flock of turkeys; at our approach they hastened to the groves" and again "we frequently saw,.... turkeys...., but they knew their safety here, keeping far enough out of our reach." When 30 miles from St. Marks, he finds "the forests and native meadows (abound) with wild game, as....turkeys,....." At Tanase he "avanced into strawberry plains to regale on the fragrant delicious fruit, welcomed by communities of the splendid meleagris....."

In 1806, Priscilla Wakefield (l. c., p. 92) when at St. Juans, Fla., writes of this species as follows: "Of a morning we have been awakened by the beams of the new-risen sun, and the cheerful crowing of the wild turkey-cocks, calling to each other from the tops of the highest trees. In the spring they begin at break of day, and crow till sunrise, saluting their fellows on the return of light." Twenty-

six years later, 1832 Timothy Flint (l. c., Vol. I, p. 210.) finds at Pensacola that "wild turkeys are constantly offerred for sale by the Indians." Five years previous 1827, John Lee Williams records[1] "Wild Turkey-*Meleagris americana* plenty," and in a subsequent work, 1837 he gives it more attention.[2] "The Wild Turkey, meleagris Americana, stands at the head of the festive board, and is abundant in most of the new settlements."

Mississippi, Alabama and Louisiana.

In this region the record begins with the last voyage of La Salle to discover the Mississippi. "The plains lying on one side of it "he says[3] "are stored with....turkeys;....." At Maligne River, "our hunters killed....turkeys....." On this same journey, when at Bay St. Louis he remarks,[4] "We had also an infinite Number of Beeves....Turkeys....." At Le Boucon, they saw turkeys and of the country through which he passed he notices that "There are Abundance of Deer....and all Sorts of wild Fowl, and more especially of Turkeys."

Du Pratz in the early part of the eighteenth century was traveling in Louisiana, and in several places in his account of his journey he mentions the turkey.[5] "The French settlers raise in this province turkies of the same kind with those of France." In another place he notes that "Many of the women wear cloaks of the bark of the mulberry tree or of the feathers of swans, turkies or India ducks." In one instance, he writes of the turkey at some length. "I shall now proceed to speak of the fowls which frequent the woods, and shall begin with the Wild-Turky, which is very common all over the colony. It is finer, larger, and better than that of France. The feathers of the turky are duskish grey, edged with a streak of gold colour, near half an inch broad. In the small feathers the gold-coloured streak is not above one tenth of an inch broad.

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[1] Williams, John Lee. A View of West Florida, etc. Phila., 1827, p. 31.
[2] —— ——. The Territory of Florida, etc. New York, 1837, p. 73.
[3] French, B. F. Hist. Colls. of La., Part I. New York, 1846, pp. 176, 136, 121.
[4] Joutel, M. A Journal of the last Voyage Performed by M. de la Salle to the Gulph of Mexico. Translation London, 1714, pp. 62, 78, v, 82, 87.
[5] Du Pratz, M. LeP. l. c., pp. 283, 363, 276, 277, 161.

The natives make fans of the tail, and of four tails joined together, the French make an umbrella. The women among the natives weave the feathers as our peruke-makers weave their hair, and fasten them to an old covering of bark, which they likewise line with them, so that it has down on both sides. Its flesh is more delicate — fatter and more juicy than that of ours. They go in flocks, and with a dog one may kill a great many of them. I could never procure any of the turkey's eggs, to try to hatch them, and discover whether they were as difficult to bring up in this country as in France, since the climate of both countries is almost the same. My slave told me, that in his nation they brought up the young turkies as easily as we do chickens."

Schultz (l. c., pp. 182, 184) in 1810 says "Those (birds) which may be considered as local (New Orleans) are,. . . . .wild turkey. . . . ," and 1817 Samuel R. Brown practically repeats (pp. 146, 233) the same observation. Of Mississippi, he says that "The traveller here finds. . . .wild turkeys in frequent flocks." In the Nation of the Creek Indians (Ouchee River) Adam Hodgson 1820 (Mar. 20) writes [1] "He (Landlord) gave us a plain substantial fare, which. . . . (is) sometimes varied by the introduction of wild venison or wild turkies" killed by the Indians and furnished the landlord at little cost. About the same time, Thos. L. McKinney writes (l. c., p. 159) of the Chickasaw country as follows: "Nearly the whole of the country of Chickasaws, through which I had, so far, passed was poor. Wild turkeys plenty." In his trip up the Alabama River between Montgomery and Mobile, Arfwedson notes that [2] "Immense quantities of wild ducks and wild turkeys were constantly disturbed by the paddles of the steamboat, but we often passed through flocks of them without causing the least fright." In "Recollections of Pioneer Life in Mississippi" by Miss Mary J. Welsh, we find that [3] "turkeys. . . .were abundant" in 1833–1836. The last note to be entered in this list is by C. C. Jones. He speaks of the Choctaws who made [4] "turkey-feather blankets with the

[1] Hodgson, Adam. Letters from North America, ... 2 vols. London, 1824, Vol. I, pp. 118, 125.

[2] Arfwedson, C. D. The United States and Canada, in 1832, 1833, and 1834. 2 vols. London, 1834, Vol. II, p. 41.

[3] Miss. Hist. Soc. Publications. Vol. IV, p. 349.

[4] Jones, C. C. Southern Indians. 1873, pp. 87, 77, 322.

long feathers of the neck and breast of that fowl. The inner end of the feather was twisted and made fast in a strong double thread of hemp or coarse twine made of the inner bark of the mulberry-tree. These threads were then worked together after the manner of a fine netting. The long and glittering feathers imparted to the outside of the blanket a pleasing appearance. Such fabrics were quite warm."

Kentucky and Tennessee.

In this region we have several interesting notes. John Lederer comments on its[1] "Great variety of excellent Fowl, as wilde Turkeys,....." In early voyages up and down the Mississippi we find mention of this form. Cavelier's account of La Salle's Voyage remarks[2] "how the whole nation (of Indians) had greatly honoured them and held them for something more than men, on account of the power of their guns: that they wondered to see them kill....several turkeys at a single shot." St. Cosme remarks that they took several turkeys during his voyage (before 1700). In 1700, Gravier alludes to the turkey mantles. "Sometimes they (the men) too, as well as the women, have mantles of turkey feathers....well woven and worked." Of the early times in Kentucky (Boone's day) Timothy Flint asserts that[3] "in the open woods,....turkeys were as plenty as domestic fowls in the old settlements." "In the sheltered glades, turkeys and large wild birds were so abundant, that a hunter could supply himself in an hour for the wants of a week. They would not be found like the lean and tough birds in the old settlements, that lingered around the clearings and stumps of the trees, in the topmost of whose branches the fear of man compelled them to rest, but young and fully fed." "They were never out sight of buffaloes,....turkeys." Of the year 1779, Rev. Mr. Davidson of Mercer County, Ky., says[4] "A winter of un-

[1] Talbot, Sir Wm. The Discoveries of John Lederer in three several Marches from Virginia to the West of Carolina ..... London, 1672, p. 25.

[2] Shea, John G. Early Voyages Up and Down the Mississippi, etc. Albany, 1861, pp. 25, 57, 134.

[3] Flint, Timothy. Biographical Memoir of Daniel Boone. Cincinnati, 1833, pp. 36, 39, 44, 58, 241, 263.

[4] Collins, Lewis. Historical Sketches of Kentucky,..... Cincinnati, 1847, p. 456.

exampled severity ensued; and numbers of....wild turkeys were found frozen to death."

During the early campaigns the turkeys often kept the wounded alive. In the autumn of 1779, Major Rodgers and Capt. Benham when near Harrodsburgh, Kentucky, so sustained themselves.[1] "Fortunately, wild turkeys were abundant in those woods, and his companion would walk around, and drive them towards Benham, who seldom failed to kill two or three of each flock. In this manner, they supported themselves for several weeks, until their wounds had healed so as to enable them to travel." In 1784 John Filson finds[2] "The land fowls are turkeys, which are very frequent,....." The same year, 1784, J. F. D. Smyth (l. c., Vol. I, p. 337) speaks in hyperbole. "Wild turkeys, very large and fat, are almost beyond number, sometimes five thousand in a flock, of which a man may kill just as many as he pleases." In 1787–1788, Mrs. Mary Dewee finds[3] "The variety of deer,....turkeys,....., with which this country abounds keeps us always on the lookout, and adds much to the beauty of the scenes around us." In writing of Kentucky in 1794, Thomas Cooper says[4] "Of wild turkies, however, there are abundance, nearly as tame as those breed in the yard. From their being extremely poor in the summer, they remain unmolested; in the winter they grow very fat, and are reckoned delicious food:" The last note of the 18th century, comes the following year (1795) when Andre Michaux reports it in Tennessee. At Nashville, he says[5] "Sunday 21st of June 1795 killed and skinned some birds. Birds:....a few species of the Genus Picus: Wild Turkeys." In Oct., 1795, he writes that on the "17th ascended the River (Cumberland) about ten Miles: there were numbers of Wild Turkeys on the banks; the Rowers and I killed five from the Canoe in passing, without landing." Finally, on Dec. 31 of the same year, he states that "most of (them) went hunting Wild Turkeys," along the Little River.

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[1] McClung, John A. Sketches of Western Adventure: ..... Phila. 1832, p. 171.

[2] Filson, J. The Discovery, Settlement and present State of Kentucke,.... Wilmington, 1784, p. 26.

[3] Penn. Mag. Hist. & Biog., Vol. XXVIII, p. 195.

[4] Cooper, T. Some Information Respecting America, etc. London, 1794, p. 38.

[5] Early Western Travels, III, pp. 33, 63, 76, 82.

In 1806, Priscilla Wakefield (l. c., pp. 135, 146) in East Tennessee "Met several flocks of wild turkeys, forty or fifty in a company." In Kentucky she records that "Wild turkeys are numerous and in the uninhabited parts so tame as to be easily shot. In autumn and winter they feed upon acorns and chestnuts. They inhabit the sides of rivers, and perch upon the tops of the highest trees." The same year, Thomas Ashe, reliable or otherwise, observes the turkey at "Kenhaway." "Several flocks of wild turkeys crossed us from the mountains to the water side, we killed two fine young birds, and could have killed forty had we been disposed to enter on the commission of unnecessary carnage." At Louisville, Ky., he writes [1] "I killed a few young turkeys, which were exquisite in taste and flavor." Near Knoxville, Tenn., Henry Ker finds [2] "The woods abound with plenty of game, such as....and turkies in abundance through the year." In 1817, S. R. Brown (l. c., p. 110) holds "Wild turkies are still numerous in the unsettled parts" of Kentucky. In the summer of 1818, H. R. Schoolcraft observes that along the Ohio river [3] "The wild turkey, quail and squirrel are daily met on either shore, and we find no difficulty in killing as many as we have occasion for."

In 1822–23, W. H. Blane reports (l. c., p. 260) "there (is) plenty of deer and wild turkeys in the woods" of Kentucky. About eight years later, Withers remarks that [4] "The body found in the saltpetre cave of Kentucky, was wrapped in blankets made of linen and interwoven with feathers of the wild turkey, tastefully arranged." The next year, 1832, T. Vigne (l. c., Vol. II, pp. 45, 57, 58) finds "Wild turkeys....are found in the barrens," near Glasgow, Ky. Of Mammoth Cave he writes that "In the neighbourhood of the cave, there are a great many wild turkeys, and a tolerable sprinkling of deer, but both were difficult of approach at that season of the year. I was exceedingly anxious for a shot at a wild turkey, but

[1] Ashe, Thomas. Travels in America Performed in 1806, etc. London, 1808, pp. 173, 235.

[2] Ker, Henry. Travels through the Western Interior of the United States. From the Year 1808 up to the year 1816. Elizabethtown, N. J., 1816, p. 311.

[3] Schoolcraft, H. R. A View of the Lead Mines,..... New York, 1819, pp. 232, 225.

[4] Withers, Alexander S. Chronicles of Border Warfare. Clarksburg, Va., 1831, p. 37.

committed a great error in loading with ball only: and although I contrived to get three or four fair shots on the ground, and on the wing, yet I confess through eagerness to have missed them. Once I contrived to near a brood, but had the mortification, although close to them, to hear them rising one by one on the other side of a thicket; and when I did pull at the last bird, my gun which was loaded with shot, missed fire through the badness of the copper cap." In the same year T. Flint's "Mississippi Valley" appears. In Tennessee (l. c., p. 340) he credulously says, "A nest of eggs of the wild turkey were dug up in a state of petrifaction." Finally in the "Sketches and Eccentricities of Colonel David Crockett N. Y. 1835," p. 193, we find that he had a special fondness for shooting the turkey in this region.

Ohio.

In all the United States, no state had more turkeys than Ohio and her neighbors. Most of our records are restricted to the 18th century and the first part of the 19th century. In Morton's "New English Canaan 1637" we find that about[1] "Lake Erocoise" "There are also more abundance of....Turkies breed about the part of that lake, then in any place in all Country of New England." Daniel Coxe in his "Carolina 2nd edit. London, 1726" (pp. 52, 79) finds "Great Companies of Turkies" all over the country. On a journey to Ohio, Conrad Weiser on Sept. 19, 1748, notes[2] this form. In 1750 Christopher Gist makes a journey from Old-town, Md., to the Ohio River. On Nov. 30, he with his men[3] "killed twelve turkeys." The following year, Feb. 17, 1751, he records that the country about Little and Big Miami Rivers, "Abounds with turkeys." In the period from 1755–1759, Col. James Smith frequently encounters this form. At Ligoneer,[4] "we found they had plenty of Turkeys, etc." Along Canesadoo-

[1] Force, P., Vol. II, p. 65.

[2] Colls. Hist. Soc. Penn., Vol. I, Phila., 1853, p. 33.

[3] Pownall, T. A Topographical Description of Such Parts of North America, ..., London, 1776, Appendix, p. 8, 11.

[4] Smith, Col. James. An Account of the Remarkable Occurrences in the Life and Travels of Lexington, 1799. Reprint, Cincinnati, 1870, pp. 7, 27–31, 36, 75, 96.

harie River, "turkeys were plenty." Between this last river and Cuyahoga they took a few small turkeys; at Cedar Point, Lake Erie, and at Sandusky they killed a number of Turkeys.

Christian Frederick Post in his journal of a trip from Phila. to Ohio shows how the turkey enters the reply of an Ohio Indian:[1] "Look now, my white brother, the white people think we have no brains in our heads; but that they are great and big, and that makes them war with us: we are a little handful to what you are; but remember, when you look for a wild turkey you cannot always find it, it is so little it hides itself under the bushes." The "Journal of Captain Thomas Morris,....Detroit, Sept. 25, 1764" records turkeys towards the Miami country. When he reaches Miami river he says[2] "We were forced for want of water to stew a turkey in the fat of a raccoon; and I thought I had never eaten any thing so delicious, though salt was wanting; but perhaps it was hunger which made me think so." In 1765, George Croghan makes a journey from Fort Pitt to Vincennes and Detroit. At the mouth of the Little Kanawha River,[3] "turkeys....are extremely plenty" (May 19) and "turkeys are very plenty on the banks of this (Scioto) River."

On June 5, 1773, Rev. David Jones[4] "Killed some turkeys" on the Scioto River, and recorded that "This country abounds with an abundance of turkeys, some of which are very large....." In 1778, Thomas Hutchins finds that in the Ohio river region[5] "a great variety of game;....as well as....turkies....abounds in every part of this country." In the region from the mouth of Great Kanawaha to Monogohela River turkies "abound" as also in the Lake Erie country. Of this same country at the same period, Dr. Knight writes that[6] "In all parts of the country through which I came, the game was very plenty, that is to say, deer, turkies and

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[1] Early Western Travels, Vol. I, p. 215.

[2] Ibid., pp. 310, 311, 321.

[3] The Olden Time, Vol. I, 1846, Pittsburgh, pp. 405, 407.

[4] Cist, Charles. Cincinnati Miscellany. Vol. I, 1845, p. 265; Vol. II, pp. 11, 232.

[5] Hutchins, Thomas. A Topographical Description of Virginia, Pennsylvania, Maryland, and North Carolina,..... London, 1778, pp. 4, 12.

[6] Narratives of the Perils and Sufferings of Dr. Knight and John Slover among the Indians during the Revolutionary War,..... 1st edit., 1782, Pittsburgh, 3rd. edit., Cincinnati, 1867, p. 30.

pheasants." In the Journal of General Butler (1785) we have at least sixteen references to the abundance of turkeys along the Ohio River. He records them at the mouths of the Muskingum, the Big Hockhocking, the Kanawaha, the Louisa, the Little Miami, and the Licking Rivers and Big Bone Creek. In the Kanawha territory,[1] "we had great sport among the turkeys....." Above Kanawha, "here we having nothing to do but spring from our boats among flocks of turkeys, kill as we please, for sport or gust,..... I have just stepped from my boat and killed at one shot two fine turkeys, and our whole party feasts on fine venison, bear meat, turkeys....procured by themselves at pleasure." Near Big Hockhocking River, "our hunter....killed....many fine turkeys, which we distributed among the families and troops with us," and finally he writes, "I cannot help here describing the amazing plenty and variety of this nights supper. We had fine roast buffalo beef, soup of buffalo beef and turkeys, fried turkeys, fried catfish fresh caught, roast ducks, good punch, madeira, claret, grog, toddy and the troops supplied in the most abundant manner."

In 1788, Col. James May reports in nine different instances the wild turkey in this same region. Around Hockhocking, his hunters in three days secures seven turkeys and seven deer.[2] "He might have killed any quantity but it is the season when they are not fat." In another place, he says "Our luck has been....to have good provisions....the best of bread, fine venison and turkeys." The same year, George Henry Loskiel writes of this form as follows:[3] "*Wild Turkeys* (Maleagris gallopavo) flock together in autumn in great numbers, but disperse in the woods towards spring. They are larger than the tame turkies, and commonly perch so high upon the trees, that they cannot be shot but with a ball. In winter their plumage is of a shining black but changes in summer to a light brown with white spots upon the wings. Their eggs are much

[1] The Olden Time, Vol. II, pp. 441, 443, 444, 445, 447, 448, 452, 454, 462, 492, 495, 496, 497, 505, 507.

[2] Journal and Letters of Col. James May of Boston, Relative to Two Journeys to the Ohio Country in 1788 and 1789. Cincinnati, 1788, pp. 44, 49, 69, 72, 74, 78, 83, 89, 91.

[3] Loskiel, G. H. History of the Mission of the United Brethren among the Indians in North America. In three parts. Translated by C. I. Latrobe. London, 1791. Part I, pp. 91, 48.

sought after, and relished by the Indians. There is a species of wild turkies, which are not eatable their flesh having a most disagreeable flavor." In speaking of the dress of Indian men, he says "Formerly these coverings were made of turkey feathers, woven together with the thread of wild hemp, but these are now seldom seen." Two years later, 1790, Chas. Johnston finds that [1] "During the whole march (through Sciota country) we subsisted on bears meat,.... turkeys.... with which we were abundantly supplied, as the ground over which we passed afforded every species of game in profusion, diminishing however, as we approached their villages." About this same time, George Imlay discovers that [2] "The rapidity of the settlement has driven the wild turkey quite out of the middle countries; but they are found in large flocks in all our extensive woods." On Aug. 18, 1793, Andre Michaux [3] "saw several flocks of wild Turkeys" beyond Wheeling.

The "Struggles of Capt. Thomas Keith in America" (p. 16) has it that in 1794 along the Ohio River, "The wild turkies were calling to each other from the lofty branches of the oak." In 1796, Brackenridge ascends the Ohio. In one case he remarks that [4] "once, having encamped somewhat later than usual, in the neighborhood of a beautiful grove of sugar-trees, we found, after kindling our fires, that a large flock of turkeys had taken up their night's lodgings over our heads: some ten or twelve of them were soon taken down for our supper and breakfast. But it was not often we were so fortunate." In 1796 and 1797, Francis Baily when at Little Miami River,[5] "saw great quantities of wild turkeys; so that we had not any prospect of extreme want whilst we were here." One other party notes it in this century. John Heckewelder with three companions in the summer of 1797 mentions the turkey in his narrative. They encounter it in a trip to Gnadenhuetten on the Muskingum, and say,[6]

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[1] A Narrative of Incidents Attending the Capture, Detention, and Ransom of Charles Johnston, ... 1790. .... New York, 1827, p. 46.

[2] Imlay, George. A Topographical Description of the Western Territory of North America,..... 2nd edit., London, 1793, pp. 100, 243.

[3] Early Western Travels, III, p. 33.

[4] Brackenridge, H. M. Recollections of Persons and Places in the West. 2nd edit. Phila., 1868, p. 30.

[5] Baily, Francis. Journal of a Tour in Unsettled Parts of North America in 1796 and 1797. London, 1856, p. 209.

[6] Penn. Mag. Hist. and Biog., Vol. VI, pp. 138, 142, 144, 146.

"The programme for each day was arranged in the following manner: In the morning at daybreak we were awakened by the cackling of the turkeys....."

Shortly after (1803) the beginning of the nineteenth century, Thaddeus Mason Harris (l. c., p. 51) says, "the vast number of turkies,....we saw upon the shore (Ohio River below Wheeling).... afforded us constant amusement." In 1806, T. Ashe (l. c. pp. 160, 111, 113, 130, 134, 135, 144, 145) gives "Wild Turkey Meleagris Gallopavo" in his list of birds, records it at Wheeling and Marietta and writes of it at considerable length when at the latter place and near Zanesville. His account follows: "The wild turkey is excellent food, and has this remarkable property, that the fat is never offensive to the stomach. When Kentucky was first settled it abounded with turkeys to such a degree that the settlers said the light was often interrupted by them. Though this may be considered a figure, still it is well known that they were extremely numerous, so much so that he was esteemed an indifferent sportsman who could not kill a dozen in a day. Even at this time they are sold in Lexington market for half a dollar a pair. They are, notwithstanding becoming very scarce, and, addicted as all classes of people in that state are to an intemperate predilection for destroying every living aboriginal creature, their total extinction must be near at hand. They yet abound in this Ohio State, and possibly will, for many years; till it becomes more peopled." "I cannot pretend that wild turkeys differ in any striking manner from the domestic ones I have everywhere seen, except the length of their wings; their superior plumage, their attitude and lively expression in walking. The cock too has a beard composed of about one hundred hairs which hangs in a streamer from under the bick. The hair is thicker than a pig's bristle, and the length accords with the age. In the young the beard is hardly perceptible, in the old it descends more than half a foot. I have killed a wild turkey cock which weighed thirty pounds and whose beard was ten inches long: the flesh was execrable, nearly as hard as iron, and as black as jet. The young on the contrary are white and tender, delicate meat, and of exquisite flavor. Wild turkeys are gregarious. The flocks from fifty to sixty. They are migratory. They winter to the southward and return in the spring to the deepest recesses of the woods, where

they construct their nests with such care and concealment, that few instances ever occur of the eggs or young being found. Where eggs have been obtained and hatched under a domestic turkey, the young shew great disposition to thrive and remain about the house very contentedly till their first spring, when they rise, without indicating a previous talent for flying, into the air, take a few circles round the heads of their old friends and make for a wilderness whence they never more return." "As evening approached, I was much pleased to come in view of a flock of wild turkeys. I wished to have an opportunity of observing their action — the one afforded me was of the best it possibly could be: they were travelling before me — therefore occasioned no loss of way. The flock consisted of about thirty-four, on the ground, searching for food: they were not considerably alarmed till I had approached them within sixty yards. They then moved on a kind of long hop and run, stopped, and as we gained on them proceeded in the same way. On a nearer approach, they took short flights, rose above the trees, and lighted upon them at intermediate spaces of about thirty rods. At every rest I instructed Cuff to gobble in their manner. This act appeared to attract their attention and retard their flight; and, what was of more consequence, they made responses, which guided our pursuit when they were obstructed from view by the thick ombrage of the woods, and the fast approach of night. They finally went a more considerable distance; and as I judged, to a favorite place to roost. I still had the good fortune to keep in their track, and to come directly on the spot they had chosen for their rest. They rose up with much perturbation and noise, and again descended to rest. The whole gang occupied four trees, and still they rose, fell and acted with one accord. I resolved to fire on them. I had heard, that whenever wild turkeys settled to roost, there they remained in spite of all opposition. My motive in firing then was to ascertain the fact. On the first shot they all rose with great clamour about thirty yards above the summits of the trees, and as instaneously descended direct upon them. On firing again, similar circumstances occurred, and at a third discharge no variation succeeded, nor did they betray the least disposition to depart effectually and remove their quarters. My first discharge was with a ball, which brought down a very fine bird, the two last merely powder — but I

regard the fact to be ascertained as firmly as if I had killed the whole flock. This dull propensity in these animals must ultimately operate to their destruction. There is no manner of doubt but had such a flock come within reach of a sportsman of the Virginia shore, he would have brought every one of them to the ground."

In 1812, James L. Barton when at Tymoctee Creek, finds that[1] "the wild turkeys began to gobble in the woods (at daylight), and they made nearly as much noise" as the wolves during the night. In the "History of Athens Co., O.," Chas. M. Walker (l. c., p. 486, 479) asserts that in 1810 "turkeys were very plenty" and in 1820 in the fall season the settlers killed "turkeys beyond count for the winter stock." In his "Pedestrious Tour,..... Concord, N. H. 1819," Estwick Evans says that west of the Connecticut Reserve[2] "Wild Turkeys too, are here numerous, and they sometimes weigh from 20 to 30 pounds." Two years later, 1821, Schoolcraft when along the banks of Auglaize near Defiance, O., reports that[3] "Tracks....of the meleagris gallipavo or turkey, were frequently noticed in our path; and these indigenous species of the American forest, are represented to be still abundant in this quarter." In 1822, James Flint on the Ohio river recounts how he[4] "saw a man fire a shot at a flock of wild turkeys. These fowl were so far from being coy, that they flew only a little way, and alighted again on the trees." When 13 miles from Chillicothe, he says "A few.... turkeys remain..... It does not require a thick population to exterminate bears, deer and turkeys." The same year, John Woods when at Troy, O.,[5] "passed fourteen or fifteen wild turkeys, in a field. As they only gently walked into the woods, I did not suspect they were wild ones; but mentioning them at the cabin, I was told there were no tame turkeys for some miles, but plenty of wild ones." T. Vigne already quoted (l. c., p. 87, reports turkeys for Mansfield, O., in 1832 but asserts that "However, I met with no turkey,....."

(*To be concluded.*)

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[1] Barton, J. L. Early Reminiscences of Western New York and the Lake Region Country. Buffalo, 1848, p. 52.

[2] Early Western Travels, Vol. VIII, p. 195 (orig. p. 96).

[3] Schoolcraft, H. R. Travels in Central Portions of the Mississippi Valley. New York, 1825, p. 71.

[4] Early Western Travels, Vol. IX, pp. 112 (orig. p. 88) 120, 121 (orig. p. 96).

[5] ibid., Vol. X, pp. 249, 250 (orig. p. 122).

GENERAL NOTES.

The Red-throated Loon (*Gavia stellata*) **at Berwyn, Pa.**—A female in winter plumage was taken on a small pond in the vicinity of Berwyn, Pa., by local hunters, November 15, 1911, and presented to me. I believe this is the only record for Chester county.— FRANK L. BURNS, *Berwyn, Pa.*

Mallards Wintering in Saskatchewan.— A number of Mallards have stayed on Wascana Lake, near Regina, all this winter, living in a small space of open water, which is kept open by warm water flowing into the lake from the power house. In December there were 25; on February 7, there were only to be seen 10, and on February 14 only 4. Whether the decrease in numbers was owing to the cold weather or to "poachers" is not yet known. On January 27, it was 48° below zero, the severest cold spell of the winter, and lasted for about four days.— H. H. MITCHELL, *Regina, Sask.*

European Widgeon in Washington.— I have the pleasure of recording the capture of a European Widgeon (*Mareca penelope*), which I think is the first ever recorded from the state of Washington. It is a young male which has not reached the adult plumage, and was taken by Mr. L. W. Brehm, of Tacoma, Wash. Date of capture January 12, 1915. The locality was the Nisqually Flats, Thurston County, Wash. Mr. Brehm informs me that there was a flight of several thousand Baldpates (*Mareca americana*), but that he saw no others resembling *penelope*.—J. H. BOWLES, *Tacoma, Wash.*

Harlequin Duck in the Glacier National Park, Montana.— I was much interested in the note of Mr. Warren on the Harlequin Duck (*Histrionicus histrionicus*) in the Glacier National Park (Auk, XXXI, 535). During the past summer, 1914, I spent two weeks in the Park and also observed this species. Five birds were seen on the Upper Two Medicine Lake, August 4 and 5. The evidence goes to show that this species is a regular though not common summer resident of the lakes and streams, not only in the Park itself, but also in other high mountains in this section of Montana. That the species breeds in the Glacier Park is shown by one of the earliest records. Dr. Elliott Coues saw several broods and secured an adult female and three young on Chief Mountain Lake, August 20–22, 1874 (Birds of Montana and Dakota along the 49th parallel, p. 653). Chief Mountain Lake is now down on the maps as Waterton Lake. The greater part of it lies in the Park, but its northern end crosses the border into Canada.

It is of interest to note that Dr. Coues also found a brood of Barrow's Goldeneye (*Clangula islandica*) at this same time and place and secured young. This species also probably still breeds in the vicinity, but it has not been recently recorded.— ARETAS A. SAUNDERS, *West Haven, Conn.*

The Blue Goose (*Chen caerulescens* (Linn.)) in Rhode Island.— The Boston Society of Natural History has recently acquired the skin of an adult female Blue Goose taken at Dyer's Island, Rhode Island, by Mr. Sinclair Tucker, November 9, 1912.

So far as I am able to ascertain this is the second record for Rhode Island, and the fourth for New England.— W. Sprague Brooks, *Milton, Mass.*

Occurrence of the Pectoral Sandpiper (*Pisobia maculata*) near Salem, N. J.— The absence of recent records of this species in the Delaware valley moves me to make known at this late date the capture of a male by Dr. H. B. Wharton, September 16, 1905, at Salem county, N. J. The specimen was preserved by me and is in my collection.— Frank L. Burns, *Berwyn, Pa.*

The Whimbrel, Ruff, Buff-breasted Sandpiper, and Eskimo Curlew on Long Island, N. Y.— Through the courtesy of Mr. John H. Hendrickson of Jamaica, N. Y., I am able to record the occurrence on Long Island of these four Shorebirds. The specimens of the two European species were brought in the flesh to the American Museum and are now preserved in its mounted collection of local birds.

The Whimbrel (*Numenius phæopus*), which proved on dissection to be a male, was shot by Mr. S. M. Van Allen, of Jamaica, Long Island, at Gilgo Inlet, Great South Bay, south of Amityville, on Sept. 4, 1912. It was in the company of two Hudsonian Curlews. This appears to be the first record of the Whimbrel for the United States. According to the A. O. U. Check-List, it is of occasional occurrence in Greenland and has been taken once in Nova Scotia.

The Ruff (*Machetes pugnax*), an immature male judging by size and plumage, was collected by Mr. Hendrickson near Freeport on September 26, 1914. It was alone and was attracted to the decoys by imitations of the calls of Yellowlegs and Robin Snipe. There are numerous North American records for this species, including two previous Long Island captures.

Mr. Hendrickson states that during the past half-dozen years he has collected three Buff-breasted Sandpipers (*Tryngites subruficollis*) near Freeport, and could have secured another one the past season.

Regarding the Eskimo Curlew (*Numenius borealis*) Mr. Hendrickson writes: "When I was on the meadows two years ago last September I saw two birds which I believe were Esquimo Curlews. As we were aboard the boat getting it ready to leave, these birds flew within about twenty-five yards of us, and I had a good opportunity to observe them closely. They were not the Hudsonian Curlew, commonly called "Jacks"; they were much smaller and less wary than the latter. I know the Esquimo Curlew, having shot several specimens a number of years ago, and at the time I told my friend that was what I believed these birds were."— W. De W. Miller, *American Museum of Natural History, New York City.*

The Diving Instinct in Shore-birds.— In looking over an old note-book I find the following information which seems of considerable interest. On August 4, 1912, while looking for early shore-birds at Toro Point, Panama, I knocked down an immature Spotted Sandpiper (*Actitis macularia*). The beach at that point is a wide coral reef, bare at low tide, and with occasional openings or " wells " connected underneath with the sea. Some of these are of considerable size and the water in all is as clear as crystal to all depths — clear as only those who have seen such tropical " coral water " can imagine.

Upon my approach my crippled bird ran to one of these pools and went over the side, resting on the water surface. As I reached slowly down to take him, he surprised me by diving and swimming under water, using his wings only, to the opposite side of the pool. The action was so sudden and so surprising to me that I could not be sure of the manner of diving but it must have been a " tip-up " and a head first plumage almost straight down.

I had however a perfect view of the bird as he " flew " the ten feet across the pool, through the beautifully clear water which showed white pebbles distinctly on a bottom perhaps twenty feet below. The bird crossed at a uniform depth of eighteen inches to two feet, which he held until he brought up against the opposite wall. The head and neck were extended but not at all stretched while the legs and feet trailed behind with flexed toes, like a heron in flight. The wings seemed to be opened to only perhaps half their full extent — the primaries pointing well backward like wings are trimmed as birds cut down from some height to alight. The wing-beats were slow and even but not labored, and progress was uniform and not at all hurried.

Upon coming up against the opposite wall, the bird rose slowly to the surface, and again rested there as before. The entire performance seemed perfectly natural and unstrained. I tried to have him repeat but he would not, allowing me to lift him from the water without further resistance or effort to escape. Wings and legs were both intact, his wound being in the body, and his body feathers were astonishingly dry after his comparatively long under-water flight.

From what period in his ancestry did he inherit this almost obsolete instinct?— L. L. Jewel, *Wytheville, Va.*

The Little Black Rail on Long Island, N. Y.— On May 24, 1914, Messrs. J. M. Johnson, S. V. La Dow and I were on Jones' Beach, opposite Amityville, studying the shore-bird migration. We were walking through a grassy marsh, the others slightly ahead, when I saw a little bird running like a mouse behind a tussock some 10 feet ahead of me. Thinking it might be a rail, I rushed forward immediately and was lucky enough to flush the bird, which flew up in front of me about 3 feet away. It fluttered forward feebly a short distance, then turned and flew directly past me, not more than 10 feet away and about 2 feet above the grass, landing in a

dense reed-bed some 30 feet behind. It looked about as large as a Song Sparrow, slate grey all over with black wings and back spotted with small white specks. The iris was bright red. Knowing it to be a Little Black Rail almost as soon as flushed, I shouted to my companions who immediately turned round and saw the bird while it flew past and back of me. They were able with glasses to make out all the color markings except the red eye. I had a pair of prism glasses, but was unable to use them as the bird was too near. The flight is much more feeble than that of any other rail with which I am familiar; the bird seemed barely able to sustain its weight in the air, while its legs dangled down helplessly behind. Unless seen at very close range this species would resemble, I think, a young Sora, though to anyone familiar with the latter species the great difference in size would be striking. Unfortunately I had no means of collecting it, and my last remark would seem to prejudice my case, were it not for the facts that (1) the Sora is a rare summer resident on Long Island, (2) its nest and eggs have never been found so early on Long Island as far as I know, and (3) in any case, it would be impossible for a young Sora to be on the wing by May 24. Finally I have been familiar with the Sora in all plumages for several years. Eaton in his 'Birds of New York' records five specimens of the Black Rail actually taken in the State, three of them from Long Island. It has also been reported as seen at close range on five occasions from the interior of the State. Accordingly this would be the fourth Long Island record and the eleventh for the State.— LUDLOW GRISCOM, *New York City.*

Richardson's Owl and Other Owls in Franklin County, New York. — A specimen of Richardson's Owl (*Cryptoglaux funerea richardsoni*) in the flesh was recently received by the American Museum from Dr. Wm. N. MacArtney of Fort Covington, Franklin Co., N. Y. The bird was shot on November 14 in a cedar thicket near Fort Covington, in the township of that name, by Wm. N. MacArtney, Jr.

Dr. MacArtney writes that he shot one of these Owls in the nearby township of Dundee, Province of Quebec, within a few rods of the State line in 1879 or 1880; and about 1885 one taken in the same town was brought to him, the latter specimen being now in his collection. All three birds were secured in late fall or early winter.

Eaton, in his recently published 'Birds of New York,' states that there appear to be but two definite records of Richardson's Owl in the State, one from Oneida County, the other from Essex County.

Dr. MacArtney states that during the winter the Snowy Owl is frequently observed, and occasionally the Hawk Owl, Barred Owl and Great Gray Owl. The Long-eared Owl is seen at times, while the Great Horned, Saw-whet and Screech Owls are common, the rufus phase of the last being rather rare.— W. DEW. MILLER, *American Museum of Natural History.*

Lewis's Woodpecker taken in Saskatchewan.— A fine plumage adult male was taken at Herchel, September 24, 1914, and is now mounted in

the Provincial Museum at Regina. I do not know of any record of this species having previously occurred in this Province.— H. H. Mitchell, *Regina, Sask.*

Prairie Horned Lark in Rhode Island in Summer.— While walking on the morning of June 25, 1914, down a road through some fields bordering Brightman's Pond, near Watch Hill, R. I., two birds were noticed running rapidly ahead of me. Finally they stopped and dusted themselves in the sand, permitting me to approach within close range by careful stalking behind a fence. They proved to be Prairie Horned Larks in fine plumage, the throat and sides of the head being very white. In about five minutes they flew away over a stone fence, uttering the characteristic lark note, but a long search failed to reveal them again. Two days later the whole territory was thoroughly searched, but the birds could not be found, and my hopes of finding some evidence of breeding were frustrated. The Prairie Horned Lark has always been rare in Rhode Island, and I know of no other summer record.— Ludlow Griscom, *New York City.*

Crows Nesting on the Ground.— On a large Island at the head of Lost Mountain Lake, Saskatchewan, June 10, 1913, I found several Crows nesting on the ground. Some of the nests, which mostly contained young, were on the ground between wild rose bushes, others placed on clusters of rose and other low bushes, thus raised a few inches off the ground. I might add that within a radius of twelve feet of one of these Crow's nests was a Mallard's nest containing ten eggs and a Short-eared Owl's with six young, of various sizes.— H. H. Mitchell, *Regina, Sask.*

The Bermuda Crow.— In 'The Ibis,' April, 1914, p. 189, J. N. Kennedy discusses the Bermuda Crow, alluding to the fact that Bradlee and I were somewhat in doubt as to what the species might really be. He rightly, I think, refers it to *Corvus brachyrhynchos brachyrhynchos* Brehm. Mr. Kennedy had before him one example from the British Museum collection, taken by Capt. H. Edmund, in February, 1875, which must have been very soon after its introduction into the islands. This specimen he says has less violet lustre on the feathers of the back than usual and was possibly an immature bird.

According to D. Webster Prentiss (Auk, 1896, p. 237), the Crow was introduced into the Bermudas from the United States, some twenty years before, increased rapidly and became a great nuisance, and in consequence was nearly exterminated. Since that time the crow has continued to exist, though in extremely small numbers in the Bermudas.

We have in the Museum of Comparative Zoölogy one adult (sex not determine) specimen, No. 63727, taken for us by Prof. E. L. Mark, in the autumn of 1912. This differs in no way from autumn killed crows from the eastern United States. It affords the following measurements: — wing, 319; tail feathers, 190; tarsus, 59; culmen, 47.5 mm. This specimen proves that the much discussed Bermuda Crow is *Corvus brachyrhynchos*

brachyrhynchos Brehm, apparently thus far unchanged in the new island home into which it has been introduced by man.— OUTRAM BANGS, *Mus. Comp. Zoöl., Cambridge, Mass.*

The Orange-crowned Warbler in Cambridge, Mass., in December. — On Sunday, December 13, 1914, at about 4 o'clock in the afternoon, I noticed a small bird flitting to and fro in a vine which grows on my neighbor's piazza railing about 30 yards from the room in which I was sitting. The actions of this bird at once attracted my attention. While they somewhat resembled a kinglet's, they were not so quick and restless, and were those of a warbler.

The bird was not shy and during the 10 minutes I observed it I got within 4 or 5 feet of it, and had ample opportunity to observe it carefully through field glasses. Its under parts were dull greenish yellow becoming a little darker on the breast, there was a whitish eye-ring and a very faint showing of dull greyish wing-bars. The head was about the same color as the back and tail, a greenish olive brown. It appeared to be feeding on seeds and berries that grow on the vines.

The bird was unquestionably an Orange-crowned Warbler, and its occurrence in December seems worthy of notice. So far as I know, while there have been a number of November records (W. Brewster's 'Birds of the Cambridge Region') and one for Jan. 1, 1875 (Dr. C. W. Townsend's 'Birds of Essex County') this is the first December record for Massachusetts.— HENRY M. SPELMAN, JR., *Cambridge, Mass.*

A Winter Record for the Palm Warbler on Long Island, N. Y.— In the plains country south of Hicksville, on Dec. 13, 1914, the writers saw an example of *Dendroica palmarum palmarum* (Gmelin), and were enabled to examine it carefully through field glasses at a distance of only a few paces. The bird was first flushed from a pile of brushwood overgrown with brambles. Thence it flew into a cultivated field and skulked among growing cabbage heads, but after being stalked by us for a few minutes it returned to the thicket where we positively identified it.

Eaton's 'Birds of New York' (1914) quotes no winter record of the species in New York State, and Braislin's Long Island 'List' (1907) gives the latest autumn record of this subspecies as October 10 (and on this date I saw one at Forest Hills, L. I., 1914 — C. H. R.).— R. C. MURPHY, *Brooklyn Institute Museum*, and C. H. ROGERS, *American Museum of Natural History, New York City.*

The Blackburnian and Bay-breasted Warblers at Martha's Vineyard, Mass.— These warblers are quite rare in eastern Massachusetts, therefore it may be well to record the following observations:

Chapman notes in his 'Handbook of Birds of Eastern North America': Blackburnian Warbler, "Cambridge, T. V., uncommon." Bay-breasted: "Cambridge, rather rare T. V."

Howe and Allen in their 'Birds of Massachusetts' say: Blackburnian Warbler: "Martha's Vineyard: 'Transient. Rare.'" Bay-breasted: "Martha's Vineyard: 'Transient.'"

When at my summer place at Oak Bluffs, M. V., which is located in an oak grove, I am usually alert for birds, it being a favorable place for observation. About 10 A. M., May 21, 1905, a most delightful morning, I heard a warbler's song with which I was unfamiliar. Upon investigating I discovered a pair of Blackburnian Warblers (*Dendroica fusca*) in the lower branches of an oak, 15 feet from cottage. They were beautiful, graceful birds; flitting from branch to branch, catching insects, singing now and then; spreading their tails, showing their white webs and their black and white and orange parts showing to perfection. I had a near view of the handsome male and his slightly plainer mate, both being in their faultless nuptial dress. I had waited years for this sight and enjoyed it thoroughly.

September 12, 1914, while exploring the pine barrens near East Chop, Martha's Vineyard, where the Grasshopper Sparrow and the Heath Hen sometimes occur, I encountered a flock of probably 125 migrating sparrows and warblers. I examined several of the latter which proved to be Blackpolls, and then a warbler attracted my attention which had an unusually deep yellow breast. I at first thought it one of the comparatively highly colored, fall Pine Warblers. I quickly lost sight of this bird and searched for another, which I soon found, and by its chestnut flanks and white tail patches I recognized the Bay-breasted Warbler (*Dendroica castanea*). There were surely two in the mixed flock and doubtless more.— CHARLES L. PHILLIPS, *Taunton, Mass.*

The Cape May Warbler (*Dendroica tigrina*) as an Abundant Autumnal Migrant and as a Destructive Grape Juice Consumer at Berwyn, Pa.— For several years, previous to the crushing sleet of the past winter, a pie cherry tree crowned with the foliage of a fugitive Clinton grapevine overhung my shop platform; and a thirty foot pine bending under the weight of several Niagara grapevine runners, stood close to my bedroom window. These vines remained unpruned principally because the fruit served as a capital lure for many migrating birds in just the places most convenient for observation.

From the cherry tree I secured an adult female Cape May Warbler on September 25, 1909, a notable capture at that time since it was my first fall record.

From the same tree, on September 12, 1913, I took a specimen each of the Cape May and Tennessee Warblers, and on the 14th and 15th observed twenty and thirty adult and immature female Cape Mays on the pine tree. These birds were almost constantly on the move, darting after one another, only now and then pausing an instant to gather some minute insect from leaf or fruit, especially about the grape bunches; and six shots failed to drive the survivors from the tree. By the 19th, the number diminished to

about ten individuals, all extremely tame, and one was closely approached as it perched upon a bunch of Clinton grapes eating the pulp or juice, I was unable to tell which. Again on the 20th, I saw an individual alight on a bunch of Niagara grapes, deliberately puncture the skin and eat greedily; this and several other specimens were taken with dripping bills.

No adult males had been noted from the first, the proportion of young increased as the days passed, and the individuals grew less active, more deliberate, reminding one of the Vireos; though it appears characteristic of this species to inhabit for a time one or two isolated trees in a yard.

None were noticed on the 23d, but on the following day they were present in considerable numbers allowing an approach within four feet, and on the 27th again became common, though all appeared immature. By October 2, the six or more present were all immature females. On this date I examined closely the fruit remaining on the two trees, and found about 50% showing triangular or ragged punctures, which the bees, especially the yellow jackets, swarmed about and sucked freely. On the 4th, I secured apparently adult male showing some traces of orange cheek patches; the only one observed during the flight; and up to their final departure, on the 7th, there was a fair proportion of yellow-breasted adult females.

Specimens secured early in this remarkable flight carried no fat, in fact were rather lean, but after some days of feeding became fat, inactive and even sluggish; an adult female shot in the act of eating from a grape, and brought to me for identification by a neighbor, was positively enveloped in fat, and the skin became so saturated with oil I had the greatest difficulty in saving it. I do not recall having handled a more oily specimen of this size.

The Flicker (*Colaptes auratus luteus*), Blue Jay (*Cyanocitta cristata cristata*), Purple Grackle (*Quiscalus quiscula quiscula*), English Sparrow (*Passer domesticus domesticus*), White-throated Sparrow (*Zonotrichia albicollis*), Scarlet Tanager (*Piranga erythromelas*), Waxwing (*Bombycilla cedrorum*), Red-eyed Vireo (*Vireosylva olivacea*), Black and White Warbler (*Mniotilta varia*), Black-throated Blue Warbler (*Dendroica cærulescens cærulescens*), Magnolia Warbler (*D. magnolia*), Black-poll Warbler (*D. striata*), Ovenbird (*Seiurus aurocapillus*), Redstart (*Setophaga ruticilla*), Catbird (*Dumetella carolinensis*), Brown Thrasher (*Toxostoma rufum*), Hermit Thrush (*Hylocichla guttata pallasi*) and Robin (*Planesticus migratorius migratorius*), were present and eating grapes, whole or piecemeal, but they were generally easily frightened away and the damage they occasioned confined to the fruit on the trees. The Cape May Warbler, however, overflowed to wherever grapes were found, and did considerable damage to all unbagged bunches in the vicinity and also at Paoli, two miles west.

I sent ten stomachs to Mr. W. L. McAtee of the Biological Survey and avail myself of his kind permission to publish his reply. "Hymenoptera constituted on an average 57.5 per cent of the contents of the stomachs. A third perhaps of this material was parasitic Hymenoptera and their

destruction counts against the bird. The others were ants and small bees and are of neutral importance except perhaps the ants which may be injurious. Diptera made up 16.7 per cent of the stomach contents and again a large proportion of them were parasitic species. Lepidoptera (small moths) constitute 16.7 per cent, beetles 7.8 per cent and the remainder was made up of Hemiptera, spiders and miscellaneous insects. Except for the spiders the food was entirely composed of insects, and a large proportion of useful species were taken and no decidedly injurious ones. I should say that these Cape May Warblers did very little to pay for the destruction of grapes."

In 1914, about half a dozen Cape May Warblers arrived on September 6. I watched an immature female at a distance of five feet, the bird not minding me in the least; it ran out on a twig and reaching across to a bunch of Clinton grapes, punctured one and repeatedly ate from it, none as far as I have noticed have gone through the motions of drinking with raised beak; when it was satisfied, I examined the grape and found it intact as far as the pulp was concerned, but the juice was partly extracted.

On the following day the number of individuals had doubled; further increased on the 11th, becoming common on the 12th, 13th and 14th, and by the last date the red and purple grape crop was ruined; some grapes had as many as three or four wedge-shaped punctures; while the white grapes had not been touched. However, on the 17th I found the Niagara grapes utterly destroyed. I counted forty-five grapes on a single bunch with from one to three punctures. It would seem that a fresh puncture occurred on every visit and the havoc made during the last three days. The species was very abundant until the 21st, and about ten or a dozen constantly present until Oct. 18; the last one was seen on the 20th.

Single Tennessee Warblers (*Vermivora peregrina*), were taken on October 3 and 8; and during the season, almost all the species enumerated for 1913, with the addition of the Parula Warbler (*Compsothlypis americana usneæ*) and Bay-breasted Warbler (*Dendroica castanea*); but all in greatly reduced numbers owing to the abundance of wild fruit on which they fed undisturbed.

I believe that grape juice was the principal food of the Cape May Warbler during its lengthy visit in this neighborhood. It was present in countless numbers at Berwyn and vicinity as far as a mile south of the village, apparently by far the most abundant species for a period; the complaints of the "little striped yellow bird" were many, and so far as I am able to learn, all unbagged grapes were ruined; the loss must have been many tons worth several hundred dollars.— Frank L. Burns, *Berwyn, Penna.*

Cape May Warbler Eating Grapes.— On September 12, 1914, at West Grove, Chester Co., Pa., where I spent the summer and fall, I observed three Cape May Warblers (*Dendroica tigrina*) feeding upon ripe grapes. I did not note how long this species remained with us, but I recall distinctly that for several days a few of them might be seen at almost any

time in the tree over which the grapevine grew.— ISAAC G. ROBERTS, *West Chester, Pa.*

Addendum.— Referring to specimens of the Cape May Warbler (*Dendroica tigrina*), mentioned in lines 27 and 28, there should have been, on page 105 of this volume of 'The Auk,' a footnote as follows: [2] Proc. Portland Society Natural History, April, 1882.— N. C. B.

The Rock Wren at National, Iowa.— A single individual of this species (*Salpinctes obsoletus obsoletus*) was observed on the morning of September 27, 1914, and was still here the next day. It was found in a wet ravine about the roots and thick sprouts of willow trees that grow about thirty feet from my bird blind. It had a favorite spot where in full view it would sit many minutes preening itself. While it was under observation a House Wren and English Sparrows were present with which it could be compared. Its head was not so slim as that of the House Wren, but seemed fuller or rounder, suggesting more the head of the Warbling Vireo, which was emphasized by its ashy color, while the very light breast rendered it conspicuous against the dark bark of the willows. It cocked its tail and scolded in true wren fashion.

The bird could not be taken. It was watched on both days as long as I could spare the time, and the description of it, here given, was written down while the bird was present. Rump and tail a dull rufous, the color being brighter on the rump; head and nape ashy, with a brownish wash, there being a gradual blending of this ashy with rufous along the back until the brighter rufous of rump is reached; a tinge of rufous on the tertials, the rest of the wings dark gray with darker bars; tail, rump, and back barred; no bars nor stripes could be detected on nape, head or under parts except tail; no light or white stripe over the eye; throat and breast a grayish white, somewhat lighter than corresponding parts of the *Passer domesticus*. The most strikingly marked portion was the under part of the tail, buffy white in color with conspicuous lateral bars of dark brown or black. A subterminal band of black on the tail is mentioned, also figured, in books of Mrs. Bailey, and of Baird, Brewer and Ridgway, also in 'The Birds of Washington.' I failed to see this though it might have been possible had I been on the lookout for it, as I was for the stripe over the eye. In the hand, traces of such a streak probably could have been found. The bird was studied from thirty to thirty-five feet away and I used both 8-power and 5½-power Bausch and Lomb binoculars, the latter being better for near distances.

Our place is six miles from the Mississippi River. This brings the occurrence of the species very near to the eastern limit of Iowa; and it makes the 148th species identified on our place with four or five more just beyond our borders.— ALTHEA R. SHERMAN, *National, Iowa.*

Corthylio — A Valid Genus for the Ruby-crowned Kinglet.— The genus *Regulus* as currently recognized comprises some eighteen forms

representing several specific types. These fall into two groups, the larger of which, including the Gold-crests and Fire-crests is Holarctic in distribution, the other containing the Ruby-crowned Kinglets only (a continental species of three races and a closely allied island species) being strictly Nearctic.

As long ago as 1850 Cabanis referred *Regulus calendula* to his genus *Phyllobasileus*, which included small Willow-Wren-like forms now included in *Reguloides*. Three years later, however, concluding that *calendula* was more nearly related to true *Regulus* yet generically distinct he proposed for it the name of *Corthylio*.

As is well known the type of *Regulus* (*R. regulus*) and its immediate allies differ from *R. calendula* (and from all other birds as well) in the presence of a single flat feather overlying each nostril. This represents the several much smaller and more bristly antrorse plumules of the Ruby-crown. The latter is further distinguished by longer tarsi, a larger and wider bill, absence of stripes on the head and uniform olive-green crown of the female.

In spite of these differences, however, it has not seemed necessary to separate the Ruby-crown from *Regulus*, and Cabanis's genus has been almost universally ignored. The discovery of an additional character now renders necessary, in my opinion, the recognition of *Corthylio*.

While recently identifying some bird remains from the crop of a Sharp-shinned Hawk, I was struck by the peculiar form of the hind-toe of a foot which proved to be that of a Golden-crowned Kinglet. The pad forming the sole of the toe for its basal half is approximately obovate (broader terminally than basally), abruptly contracted distally, the sub-truncate end strongly contrasting with the narrow terminal half of the toe. This conspicuous pad is shorter than the rest of the toe beyond it (excluding the claw) and reticulated into about a dozen polygonal sections. No other birds examined (including Mniotiltidæ, Sylviidæ, Fringillidæ, Paridæ and Vireonidæ) at all closely approach the species of true *Regulus* in these peculiar features, in which they seem to be as unique as in the supranasal plumule.

In the ordinary song-bird foot the sub-basal pad of the hallux is tapering or gradually rounded terminally, where it is usually not very strongly defined, longer than the distal portion of the toe, its superficial divisions minute and very numerous. *Reguloides superciliosus* is normal in these respects, and *Regulus calendula* exhibits but a slight approach to true *Regulus* in the form of the pad, which is longer than the rest of the toe, the reticulations being larger than usual but smaller than in true *Regulus*.

If the validity of *Corthylio* as a genus is conceded the names of the Ruby-crowned Kinglets will stand as below. The Guadalupe form is in my opinion (based on examination of an excellent series) specifically distinct. Neither in coloration (at least in fresh plumage), in the relation of bill and tarsal length to that of the wing, nor in the mutual proportions of the ninth and tenth primaries, is there any evidence of intergradation with the continental forms. "*Regulus cuvieri*" is referable to true *Regulus*.

Corthylio calendula calendula (Linnæus).
" " *cineraceus* (Grinnell).
" " *grinnelli* (Palmer).
" *obscurus* (Ridgway).

W. DEW. MILLER, *Amer. Museum of Natural History, New York City.*

A Note on the Migration at Sea of Shore Birds and Swallows.— The following notes, made during the cruise of the whaler *Daisy* in 1912, throw a little light on the oceanic routes sometimes followed by migrating shore birds and swallows. It is quite probable that the recorded positions, which lie well to the eastward of Bermuda, are not in the normal tracks of the North American species mentioned. The month of August, 1912, was, however, prevailingly calm in the western temperate Atlantic, and the possibility of migrants having been blown out of their courses would seem to be limited to the effects of local storms.

Ereunetes pusillus. On August 16, in lat. 31° 22′ N., long. 60° 14′ W. a sandpiper of this species flew around the vessel, not daring to alight. After circling for some minutes near the water it mounted higher and higher until it was flying about the topmast heads. When it had gone off the sailors told me that several of " the same kind " had been standing on the *Daisy's* bowsprit (!) during the morning.

Pisobia maculata (?) August 23, lat. 32° 20′ N., long. 50° 35′ W. Late in the afternoon a sandpiper was observed. It circled the brig for an hour, without coming very near, and *settled into the water* for several brief rests. Finally, I saw it perch upon our bowsprit, but it left almost immediately. I believe that the bird was a Pectoral Sandpiper, but am not quite positive.

Hirundo erythrogaster. August 17, lat. 31° 31′ N., long. 58° 40′ W. Four Barn Swallows joined us at noon and perched in the rigging while they preened their feathers thoroughly. At seven in the evening half a dozen were sitting along the royal brace, with others flying pathetically around the brig, evidently puzzled, and doubtless hungry. Next morning, and throughout the day (Aug. 18), several were with us, one of which sat for its photograph within a yard of the camera.

Hirundo rustica. European Barn Swallows twice came on board, the first time on September 15, thirty miles west of St. Antão, C. V. I., and again on September 29, in lat. 8° 16′ N., long. 24° 25′ W. The former bird was collected.— ROBERT CUSHMAN MURPHY, *Brooklyn, N. Y.*

Rare Birds near Waynesburg, Pa.— Waynesburg College recently secured for use in its bird course a small collection of mounted birds taken in this region some fifteen years since. Two specimens among them are particularly interesting in that they have rarely, if ever, been recorded from this section of the State. They are: Yellow-crowned Night Heron (*Nyctanassa violacea*) and Bald Eagle (*Haliæetus leucocephalus leucocephalus*). The former was collected on Ten Mile Creek and the latter on a farm near Waynesburg, Pa. In the latter part of April, 1907, I captured an injured

Florida Gallinule one mile west of this town; it is the only record for the region.— SAMUEL S. DICKEY, *Waynesburg, Pa.*

Some New York City Notes.— I elow I record personal observations of some species either of unusual occurrence, or seen in unusual places in New York City.

REDHEAD (*Marila americana*).— Two were seen on the Jerome Park Reservoir in the Bronx on January 10, 1915.

CANVASBACK (*Marila valisineria*).— On January 10, 1915, I saw seventeen Canvasbacks on the Jerome Park Reservoir. Seven were females. They allowed a close approach, and did not take wing but swam away.

RED-HEADED WOODPECKER (*Melanerpes erythrocephalus*).— I saw one of these birds in partly immature plumage near Riverdale on January 20, 1915.

WHITE-THROATED SPARROW (*Zonotrichia albicollis*).— A flock of eleven of these birds was present in City Hall Park on May 13, 14, 15 and 16, 1914. During the time that I observed them they remained for the most part under some low bushes at the southwest corner of the Park, and seemed quite oblivious to the noise of traffic in Broadway. On two occasions I heard one of them singing.

SCARLET TANAGER (*Piranga erythromelas*).— Two males in full plumage were present in City Hall Park on May 13 and 14, 1914. I saw them on the latter date. Their conspicuous color attracted large crowds and many diverting comments were overheard. The birds were mentioned in the 'Evening Sun' of May 14.

OVENBIRD (*Seiurus aurocapillus*).— I saw three Ovenbirds in City Hall Park on May 13 and 14, 1914. On the latter date they were usually near the Scarlet Tanagers mentioned above. Although they walked about in the center of the grass plots they passed unnoticed by the many persons who were watching the bright colored Tanagers.

VEERY (*Hylocichla fuscescens fuscescens*).— On May 13, 1914, I saw two Veerys in City Hall Park in company with the White-throated Sparrows noted above. They also passed unnoticed.

My experience in bird observation about New York City has been limited to two years, and the occurrence of migratory birds in City Hall Park may not be unusual. However it seemed rather startling to me to find the four last named species in the very heart of the down town section, where thousands of persons are constantly passing and there is an incessant rumble and roar of traffic. It may be of interest to note that the Tanagers were the only ones molested by the hordes of English Sparrows which infest the Park, and that even in their case I observed no serious attacks.— CLIFFORD H. PANGBURN, *Lawrence Park, Bronxville, N. Y.*

Notes from Wisconsin.— BITTERN (*Botaurus lentiginosus*).— On July 4, 1914, near Stoughton a Bittern was observed swallowing a snake about twelve inches long. The bird seized it by the head and, after

considerable manœuvring during which the snake occasionally wrapped itself around the Bittern's neck, succeeded in swallowing it.

King Rail (*Rallus elegans*).— A single bird was observed at close range on August 30, 1914, near Madison between Monona and Wanbesa Lakes. Records for the Madison region appear to be scarce.

Solitary Sandpiper (*Helodromas solitarius*).— This species was exceedingly common along the Bois Brulè river in northwestern Wisconsin during the last week of August, 1913. The birds were usually in twos, were fully as common as Spotted Sandpipers, and were not at all timid.

Ruffed Grouse (*Bonasa umbellus umbellus*).— The crops of two grouse collected by Mr. A. W. Schorger in Ashland County, in November (1914) were full of the catkins of hazel (*Corylus rostrata*, apparently). The birds were taken early in the morning. The crop of a grouse taken by the writer in Sawyer County in the first week of October (1914) was distended with small green catkins until 2½ inches in diameter. The bird was taken at dusk. It is probable that this catkin was also from hazel bushes. Bendire does not mention hazel as a food of the Ruffed Grouse though it is listed in Barrow's 'Birds of Michigan'.

Mourning Dove (*Zenaidura macroura carolinensis*).— Ten Doves were seen near Verona on Dec. 24, 1913, and one bird as late as Jan. 4, 1914, in the same locality.

Pileated Woodpecker (*Phlœotomus pileatus abieticola*).— This species was almost always in evidence during a canoe trip in the latter part of August, 1913, extending from the Lake Superior shore up the Bois Brulè and down the St. Croix River as far as Groutsburg, Wis. On a trip taken in the first part of October, 1914, down the Flambeau River from Lac du Flambeau to Ladysmith, only two Pileated Woodpeckers were seen. This species appears to retire so rapidly before settlement, that records showing present distribution may be of some value.

Red-billed Woodpecker (*Centurus carolinus*).— A single bird was seen on February 1, 1914, near Blue Mounds by Mr. Schorger and the writer.

Carolina Wren (*Thryothorus ludovicianus ludovicianus*).— On Sept. 17, 1914, the writer observed a bird of this species in a fringe of bushes on the shore of Lake Mendota, Madison. The bird was under observation for half an hour and sang frequently. It was noted again on Sept. 20 and 28. There are few records of this species in Wisconsin.— Norman deW. Betts, *Madison, Wis.*

Changes and Additions to the 'List of the Birds of Gallatin County, Montana.'— The following changes, due to recent identifications of specimens should be made in the list of Gallatin County birds published in 'The Auk,' Vol. XXVIII, pp. 26–49.

Astragalinus tristis tristis. Goldfinch.— The specimen taken at Three Forks, February 12, 1910, should be *A. t. pallidus*, Western Goldfinch. Dr. L. B. Bishop informs me that this bird while resembling the eastern form in plumage, shows by the measurements of the bill that it

belongs to the western race, as probably all of the Gallatin County birds of this species do.

Pinicola enucleator alascensis. Alaska Pine Grosbeak.— Two birds taken near Bozeman, December 21, 1908, have been sent to Mr. Robert Ridgway for better identification, and are considered by him to be the Rocky Mountain Pine Grosbeak, *P. e. montana*, and identical with the summer birds of the region.

The following new species may be added to the list through the observations of Mr. G. B. Thomas.

Marila collaris. Ring-necked Duck.— Mr. Thomas secured two birds of this species near Belgrade on October 10, 1912. They were male and female and were from a flock of eight or nine birds. This is the first record of this species from Montana of which I am aware.

Anthus spraguei. Sprague's Pipit.— Mr. Thomas has written me that he has seen this bird in Gallatin County, but I have been unable to get from him the date or exact locality of this occurrence.—Aretas A. Saunders, *West Haven, Conn.*

What Bird Lovers Owe the Late Professor King.— Not the man who determines how many birds eat a certain insect, nor what one bird eats, but the man who passes in review all the common birds of a given region in his study of the proportions of the food, is entitled to rank as pioneer in Economic Ornithology. On this basis it is proposed that the late Professor F. H. King, formerly chief of the U. S. Division of Soils, should be considered our first important Economic Ornithologist to use modern methods in the United States.[1]

Many men had previously examined the food of a single species of bird in different parts of the country. Professor Samuel Aughey of Nebraska, from 1865 to 1877, studied the stomachs of Nebraska birds in relation to the number of locusts they consumed. However, not until the time of Professors S. A. Forbes of Illinois and F. H. King of Wisconsin, had anyone made a study of all the common bird species in order to record all the types of insects which birds ate. Dr. Forbes' studies of birds' stomachs were first published in 1876, according to a letter from him, dated October 15, 1912.

In an interview at the Cleveland meetings of the American Association for the Advancement of Science, December 31, 1912, Professor Forbes admitted that the work for this paper was all done in that or the preceding year, while Professor King began his paper in July, 1873, and continued it until October, 1877, the field work being done mostly in 1873–4. In 1876–8, according to a letter from Prof. J. H. Comstock, 1912, Professor King worked in the Cornell laboratory, analyzing the contents of the birds'

[1] Cf. Review of Economic Ornithology in the United States by T. S. Palmer, Asst. Chief of the Biol. Survey, U. S. Dept. Agric. Yearbook for 1899. Here older authors are ranked as pioneers in the study of the food in birds' stomachs.

stomachs previously collected, but did not publish, due to delays in the Geological Survey, until 1883, when T. C. Chamberlain's 'Geology of Wisconsin,' Vol. 1, came off the press.

It thus appears that King's work began before that of Dr. Forbes, but was delayed in publication until some years after Dr. Forbes published his first and second researches. While Prof. Aughey had studied ninety different bird species representing 630 stomachs and Dr. Forbes some 40 species representing 460 stomachs (combining figures of all three papers of 1876, 1880 and 1883), Professor King studied 83 species representing over 1800 stomachs, 1600 of these being reported.

The University of Wisconsin has been slow to recognize the great value of Professor King's researches along this line and the noteworthy character of his work. We should take some steps to make generally available the statistical data of the paper as published in the ponderous volumes of the early 80's.

In view of these facts, a partial bibliography of Professor King's writings concerning birds may be recorded here.

1883. Economic Relations of our Birds.— Geol. of Wis., Vol. 1, pp. 441–610 (1886). Reproduced in Trans. Wis. Sta. Agric. Soc. for 1886, vol. XXIV, pp. 372–480.

1884. The Industrial Relations of Our Birds.— Trans. Wis. Sta. Agric. Soc. for 1882–3, vol. XXI, pp. 261–271.

1892. The Migration and Usefulness of Our Birds.— Arbor Day Circular, Wisconsin.

1893. The Robin.— Arbor and Bird Day Annual, Wisconsin, pp. 32–4.

1896. (Mar. 19) The Ruffed Grouse.— Arbor Day Annual, May 1, 1896, Wisconsin, pp. 23–5.

1897. (March 24) The Blue-eyed Yellow Warbler.— Arbor and Bird Day Annual, April 30, 1897, Wisconsin, pp. 8–10.

1899. (March 13) The Migration and Usefulness of Our Birds.— Arbor and Bird Day Annual, May 12, 1899, pp. 34–7. (A reprint of 1892 circ., out of print.)

1911. (Bird Migration at Hong Kong Island) Farmers of Forty Centuries. p. 62.— Pub. at Madison, Wis., by Mrs. F. H. King.— A. C. Burrill, *Madison, Wis.*

Morning Awakening Notes at Jefferson Highland, N. H.— Mr. Francis H. Allen in his general note in 'The Auk,' January, 1915, p. 110, again calls in question the genuineness of the early songs which precede the singing of the Robin as morning songs given in response to the break of day, still regarding them as songs of night. Others may share in some measure his incredulity. I desire, therefore, that my records obtained at Jefferson Highland, N. H., should remove this doubt, for they show conclusively season by season that there not only do Song Sparrows and Chipping Sparrows habitually sing several times before the Robin, but that Wood Pewee and Alder Flycatcher are always much earlier singers, and that

White-throated Sparrow, Savannah Sparrow, and Vesper Sparrow so generally sing a few songs before the Robin that it is quite impossible to regard all this earliest singing as other than the singing of the birds in response to the appearance of dawn, suffusing the eastern sky with beautiful soft light and announcing departing night and approaching day. The records indicate that the awakening of the earliest singing birds is gradual, but none the less a genuine awakening, although they give their songs only occasionally in this earliest singing and reserve more demonstrative singing until the light of day has increased. So regular are these earliest songs from the several species of earliest singers that the idea that they are songs of the night is quite untenable. Songs of the night are few, irregular, and adventitious, due to the caprice of the bird, occasionally heard, but not to be regularly looked for and with certainty heard. These earliest songs after the first light of dawn are unfailingly given and can be looked for with certainty of realization.

In the hour preceding visible dawn, which in days of earliest sunrise at Jefferson is 2.30 o'clock or a little before, I have very, very few times heard any expression of song, yet I have often been awake at one o'clock and remained awake listening carefully until I have gone out at two o'clock or a few minutes thereafter. Whereas, as the time of 2.30 approaches, it is usual to hear the first songs from one, two, or three birds which are within range of hearing, and these songs are followed by repetitions from the same birds or from other birds at infrequent intervals for a time, until their awakening is more complete. So it has been my practice to be out shortly after 2 o'clock, when not before; in season for these first responses to the break of day, and experience has shown that the birds' awakening begins with these songs, given when the dawn has already visibly brightened the eastern sky.

The Ovenbird's early flight song, which is heard quite unfailingly at dawn, is its twilight song, equally so in the morning as in the evening and late afternoon. It can be depended upon, at least in the woodlands of Jefferson Highland, and it must be borne in mind that my testimony on the whole subject of the morning awakening is the result of my experience in this mountain hamlet, where there is broad expanse of sky and complete silence reigns, when the day opens, broken only by the birds as they awake and sing.— Horace W. Wright, *Boston, Mass.*

RECENT LITERATURE.

'The Auk' Index, 1901–1910.[1]— The first 'Auk' Index was published in 1907, and covered the period 1876–1900, it including the 'Bulletin of the Nuttall Ornithological Club,' virtually the first series of 'The Auk,' and the first seventeen volumes of 'The Auk,' It set a high standard for index makers, and, as said by a reviewer (Auk, XXV, 1908, p. 100), "We know of no index to scientific literature comparable with this in point of detail and utility." The new Index, covering the period 1901–1910, is prepared on essentially the same plan, and in typography and make-up the pages of the two works are nearly exact counterparts. The index matter covers a much smaller number of pages (250 instead of 426) than were required in the earlier volume, as it embraces only ten years instead of twenty-five, but the amount per year averages twice greater. The introductory matter, however, occupies 28 pages instead of 7. This includes an 'Introduction' of ten pages by the Chairman of the Index Committee, Dr. T. S. Palmer, who is also the chief editor, giving an account of the plan of the work, the composition of the Committee, and acknowledgements of aid. This is followed by a 'Biographical Index,' and a 'Supplement to the Twenty-five Year Index,' The latter relates to the names of authors mentioned in the general index, completing names that were not given fully in the first index, and adding the date of birth, and also of death of those not now living. Of 175 names previously more or less defective 140 have been completed, at great cost of labor in efforts to secure the missing information.

The 'Biographical Index,' by Dr. Palmer, is a new feature, and one of high interest and importance as a record of the date and place of birth, and also of death in case they are deceased, of some 275 ornithologists, among which, as the author states, "will be found many of those most prominent in the annals of ornithology in America and Europe, especially during the last 40 years." In addition to these items, an asterisk prefixed to a name indicates that a biographical notice of the person has appeared in 'The Auk,' to which a reference is given. This list occupies 13 pages in double column, and we have no doubt will be consulted more frequently and valued more highly than any other part of the volume. The amount of correspondence and research involved in its compilation can be appreciated only by the few who have attempted similar work.

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[1] **Ten Year Index | to | The Auk | Volumes XVIII–XXVII — 1901–1910 | Prepared by a Committee of the | American Ornithologists' Union | Edited by | T. S. Palmer and W. W. Cooke | [vignette] New York | Published by the American Ornithologist's Union | 1915 — 8vo, pp. xxviii + 250. Price in paper covers, $2; bound in cloth, $3. Orders should be addressed to Jonathan Dwight, Jr., Treasurer, 134 West 71st St., New York, N. Y.**

It was voted to prepare the present index at the meeting of the A. O. U. held in Cambridge, in November, 1912. Dr. T. S. Palmer was appointed chairman with power to select the members of the Index Committee. "A few weeks later," as stated in the introduction, "a committee of 13 members was organized, with Professor W. W. Cooke as secretary, and at a meeting on February 7, 1913, plans were perfected and the work distributed." The aid of Dr. Dwight, Chairman of the original Index Committee, and of Dr. Richmond and Dr. Stone, editor of 'The Auk,' was secured in correcting the proof. The Committee eventually comprised 22 members, divided into three subcommittees, to each of which were assigned special features of the work. To Professor Cooke, the secretary of the committee, fell the work of preparing the copy for the press. The manuscript was in the hands of the editor in April, 1914, but through delays in printing and proofreading the issue of the work was delayed till early in 1915. The Index Committee has thus made a good record for promptness and efficiency in its difficult task.— J. A. A.

The New B. O. U. List.[1]— After a lapse of thirty-two years we have a second edition of the official list of British birds. It is well conceived, well carried out in detail and well printed. Full headings to all higher groups are given as in the A. O. U. Check-List, which is an improvement over the recent 'Hand-List' of Dr. Hartert and his associates. In the case of generic headings the reference and type are always given while the etymology and origin of all scientific names are explained. The synonymy under each species consists of references to the original place of publication, the first edition of the B. O. U. List, the 'Catalogue of Birds of the British Museum', and Saunders' 'Manual' 2nd edition; or in the case of recent additions to the first record of the bird in the British Isles. There is then a paragraph on 'Distribution in the British Islands' and 'General Distribution.' The data on Migration are not so full as in the 'Hand-List' nor are they given a separate paragraph. When subspecies are recognized the so called typical race is given binomially without the duplication of the specific name and the trinomials are printed in smaller type, following exactly the style of the original A. O. U. Check-List, a much less consistent plan than that of the last edition of this work or of the British 'Hand-List.'

In the introduction, beside the rules which governed the Committee's labors there is a 'Summary of British Birds according to their Status,' in which there are listed 141 Residents, 47 Summer Visitors, 46 Winter Visitors, 30 Birds of Passage, 61 Occasional Visitors, 149 Rare Visitors and 1 Extinct Species; total 475, an increase of 99 over the first edition. There are three appendices; (1), a hypothetical list; (2), a list of "nomina conservanda"; and

[1] **A List | of | British Birds | Compiled by a Committee | of the | British Ornithologists' Union | *vignette* | Second and Revised Edition | Published by the | British Ornithologists' Union | and sold by | William Wesly & Son, 28 Essex Street, Strand, | London, W. C. | 1915. 8vo, pp. i-xxii + 1–430. Price, 7s. 6d.**

(3), a discussion of nomenclatural matters and types of the genera. Such is the plan of the work which, except in the one point mentioned above, seems admirable.

It is of course the questions of classification and nomenclature that interest us most in a check-list. As to the former the Committee has adopted the system of 'Sharpe's 'Hand-List of Birds', reversing the order so as to begin with the Crows, which brings the work nearly in accord with the 'Hand-List' of Hartert *et al.* In matters of nomenclature: (1) the tenth edition of Linnæus has been accepted as a starting point instead of the twelfth; (2) tautonyms have been allowed; (3) trinomials have been adopted; (4) the fixation of a type for each genus according to the rules of the International Commission is recognized as a necessity. After having adopted such astounding changes from the antiquated policies that have heretofore governed the B. O. U., we feel like forgiving the Committee for the little list of thirteen *nomina conservanda* which the members refuse to relinquish, and the emendations which they feel must be made in the spelling of a few names! The advanced stand that is taken by the new B. O. U. List is certainly creditable to all concerned and makes a great stride towards that ultimate goal of uniformity for which so many of us have been striving.

Comparing the present work with the original 1883 edition we find 92 changes in specific and 51 in generic names; and yet the 'Hand-List' of Hartert *et al*, which seemed to some so impossible, contained only 111 specific changes and 72 generic!

Comparing the new list with the latter we find only 86 differences, nearly half of which are questions of the limits of genera or of the specific or subspecific rank of certain forms. Thirty cases depend upon dates of publication and the recognizability of early diagnoses or the acceptance of certain authors—as Vroeg and Oken; six hinge on whether names are sufficiently different in form to be recognized as distinct and then there are the thirteen *nomina conservanda*. Practically all of these differences can readily be settled by convention, as there is really no longer any principle at stake.

Comparing the new list with that of the A. O. U., we find less discrepancy in the matter of genera than was the case with the British 'Hand-List'. Thirteen genera of the A. O. U. list rejected by Hartert and his associates are here recognized, but many others are not regarded as separable, as *Nannus, Acanthopneuste, Planesticus, Archibuteo, Chaulelasmus, Nettion, Charitonetta, Olor, Actitis, Helodromas, Oxyechus, Pelidna, Erolia, Lobipes Ionornis* and *Herodias*. *Hierofalco* on the other hand is recognized as distinct.

The A. O. U. use of *Hirundo* is endorsed, but the use of *Bombycilla* for the Waxwings is avoided by an argument that really has no basis except on the ground of a *nomen conservandum*. *Flammea* is used for the Barn Owl, both *Aluco* and *Tyto* being preoccupied and so also with *Polysticta* for Steller's Eider, which is supplanted by *Heniconetta*.

The name *rusticolus* for the Gyrfalcon is rejected in place of *gyrfalco* and

the two races appearing under these names in the A. O. U. list are united, while two races of *islandus* are recognized from Greenland.

The use of *Colymbus* for the Loons and *Œnanthe* for the Wheatear is correct as already stated in these columns and must be followed by the A. O. U. Committee.

It is matter for general congratulation that three Committees, working independently, have been able to come to such close agreement on all matters covered by the International Code of Nomenclature, and the differences that still remain emphasize the fact that it is no longer questions of nomenclature but of taxonomy that cause diversity in names.

The Committee of the B. O. U. deserve to be congratulated upon the excellent piece of work that they have accomplished and, with the exception of the unfortunate thirteen *nomina conservanda*, we can heartily recommend the nomenclature of the new list to all who write on British birds.— W. S.

Hankin on Animal Flight.[1]— No ornithological problem has caused so much speculation, even from the earliest times, as the soaring bird; to quote Sir Guilford Molesworth, although "many theories have been advanced .... they have all been miserably insufficient"; while even Lord Kelvin admits: "That which puzzled Solomon puzzles me also." Practically everyone who has written on the matter has had a theory and the literature of the subject as a whole may be said to consist of a maximum of explanation with a minimum of observation. It is therefore a gratification to find a work that is almost exclusively devoted to observation, such as Dr. Hankin has produced,— observations moreover of the most detailed and careful kind which constitute one of the most valuable contributions to the subject of flight which has ever appeared.

The need of such a record of observation is recognized by the author who says by way of introduction: "Those best qualified to form an opinion have as a rule had little or no opportunity of studying the facts at first hand. Such authorities have, in some cases, published accounts of soaring flight which have consisted entirely of explanation. Others have related a few facts with more or less tentative explanations. The present book will be found to contain the facts of the case with no explanation at all."

Dr. Hankin's observations were carried on mainly at Agra, India, where the opportunities for the study of soaring flight — always best seen in the tropics — were excellent. His records show that there is a definite time each day when soaring becomes possible, which is earlier as the season advances. The presence of either wind or sunshine is an absolute necessity

[1] Animal Flight. | A Record of Observation. | By | E. H. Hankin, M. A., Sc.D. | Late Fellow of St. John's College, Cambridge, | Honorary Fellow of Allahard University, | Chemical Examiner and Bacteriologist to | the Government of the United Provinces | and of the Central Provinces, India, Associate Fellow of the Aeronautical Society of | Great Britain.| (First Edition) | London: | Iliffe & Sons Ltd., 20, Tudor Street, E. C. | [1913?] 8vo. pp. 1–405 + Index unpaged. Price, 12s. 6d.

for soaring, but it is an undisputable fact that soaring is possible when there exists, so far as it is possible to determine, a perfect calm.

With the idea that the sun's heat possibly caused ascending currents in the air Dr. Hankin made extended observations along this line, with the result that the time of appearance of "heat eddies" indicating upward air currents was found to coincide almost exactly with the time of the beginning of soaring.

He found, on the other hand, however, that "heat eddies" not directly caused by the sun had no relation to the "soarability" of the air and that when the solar energy that causes "heat eddies" was held back by thin clouds, soaring continued, uninterrupted.

Ordinary ascending air currents from "heat eddies," therefore, seemed not to be the basis of soaring nor did they seem sufficiently powerful, and he concludes "if soarability is due to ascending currents caused by the sun's rays, these currents must resemble heat eddies in being widely and apparently uniformally distributed," but "they must differ in containing a great deal more energy and in being as yet undiscovered."

Mr. William Brewster's observations on Gulls sailing into the teeth of the wind, near an advancing vessel were duplicated in Dr. Hankin's experience. He says the Gulls were observed in the usual "soarable area" on the leeward side of the stern and also "gliding ahead of the ship in a head wind, keeping the same speed for minutes together. Sometimes they kept at a distance of only a few feet from the bridge and so under the best condition for observation and yet no trace of any movement of the wings could be observed." He adds "were these cases of the soarable area being greatly extended or was the air uniformally soarable under the tropical sun?" Mr. Brewster's observations go to disprove the latter suggestion as they were not in the tropics.

The evidence that Dr. Hankin has gathered seems to indicate that "besides the effect of the air disturbance caused by the motion of the ship another factor of importance is the nature of the wind .... some winds are soarable and other winds are not soarable. Apparently in both cases some unknown factor affecting soarability is involved."

Dr. Hankin's observations are not limited to soaring birds but cover the whole field of flight as the following chapter headings will show: 'Preliminary Description of Soaring Flight'; 'Preliminary Account of the Conditions Necessary for Soaring Flight'; 'Preliminary Account of Directive Movements in Gliding Flight'; 'On Conditions Affecting Sun Soarability'; 'A Further Description of Steering Movements'; 'Metacarpal Descent'; 'Arching'; 'Functions of the Tail'; 'Flapping Flight'; 'Lateral Stability'; 'Position of Centre of Gravity'; 'The Flight of Bats'; 'The Flight of Flying Fishes'; 'The Flight of Sea Gulls'; 'Ascending Currents'; 'Wind Soarability'; 'Soaring in Stormy Winds'; 'Colour Phenomena of Soaring Flight'; 'Relative Efficiency of Different Wing Forms in Respect to Soaring Flight'; 'On the Flight of Dragon-flies'; 'Glossary'.

In turning over the pages of Dr. Hankin's volume one is astonished at

the extent of his observations. No factor that could possibly affect flight seems to have been overlooked and data have been collected in regard to meteorology and along other side lines with as much care as in studying the actions of the birds. A clever method of plotting the track of a bird soaring high in air was devised by tracing the movements of the bird on the surface of a horizontal mirror, with copying ink, from which impressions could readily be transferred to paper. A series of dots, instead of a continuous line, each dot corresponding to the tick of a metronome, gave in addition, the speed of the bird when the altitude had been ascertained.

The book is well worthy of the attention of every one interested in bird flight, whether or not he be inclined to supply the explanations which Dr. Hankin refrained from attempting, and unlike most treatises on flight it will be found entirely free from technical terms or mathematical formulæ.— W. S.

Snethlage's 'Catalogue of the Birds of Amazonia.' [1]— Dr. Snethlage's contributions to the ornithology of the Amazon region are well known to students of neotropical birds and her knowledge of the entire avifauna as well as her familiarity with many parts of the country fit her admirably for the task which she has just brought to a conclusion.

The catalogue consists of the technical and vernacular name of each species with references, a statement of range, a list of the specimens in the Museu Gœldi, with localities, and a description of the male and female. Under each genus is a key to the species, and under orders and families, keys respectively to the families and genera. Plates of the heads and feet of representatives of the principal groups accompany the general key to the orders. The work is, as will be noticed, intended to serve two purposes — as a manual for resident bird students and as a work of reference for ornithologists in other parts of the world.

The text is naturally in Portuguese, but this does not detract from its value to foreign ornithologists, since to them the descriptions are of the least importance, and the localities and ranges are easily made out.

There are 1117 species included in the Catalogue which forms a most valuable contribution to South American ornithology. The recent activity in the study of South American birds has reached a stage where faunal works of this sort are badly needed to bring into systematic order the scattered work of numerous writers.

Dr. Snethlage writes us that the work was published in Germany and the copies intended for the American correspondents of the Museum were held in Hamburg when the war broke out. She requests us to announce that these will be forwarded as soon as possible.— W. S.

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[1] **Catalogo das Aves Amazonicas contendo todas as especies descriptas e mencionadas até 1913 pela Dr. Emilia Snethlage (com 6 estampas e 1 mappa). Boletim do Museu Goeldi (Museu Paraense) de Hist. Nat. e Ethnogr. Tomo viii, 1911/12. Para, Brazil. 1914. pp. 1–530.**

Hornaday's 'Wild Life Conservation in Theory and Practice.' [1] — The lectures published under this title in the attractive volume before us, were delivered before the Yale Forest School, through the efforts of Prof. James W. Toumey and their delivery and publication represent, in the language of the author, the "Awakening of Yale University" to the necessity of aiding by educational methods the preservation of the wild life of America. In his preface Dr. Hornaday says further, "What is needed — and now demanded — of professors and teachers in all our universities, colleges, normal schools and high schools is vigorous and persistent teaching of the ways and means that can successfully be employed in the wholesale manufacture of public sentiment in behalf of the rational and effective protection of wild life. Thus far the educators of this country as a class and a mass have not done a hundredth part of their duty toward the wild life of the United States and Alaska. Let him who doubts this very sweeping statement ask the next young university graduate that he meets how much he has learned in his university about the practical business of protecting wild life."

The five chapter headings are: 'The Extinction and Preservation of Valuable Wild Life'; 'The Economic Value of Our Birds'; 'The Legitimate Use of Game Birds and Mammals'; 'Animal Pests and Their Rational Treatment'; 'The Duty and Power of the Citizen in Wild Life Protection'.

Dr. Hornaday has gleaned his facts from reliable publications and from his wide personal experience and has assembled them in a convincing manner, so as to make clear the economic side of the question. On the matter of practical preservation of wild life he argues in his well known forceful manner, condemning without mercy the "game hog" and all enemies of conservation, pointing out at the same time the duty of the government, the official and the citizen in furthering the work.

Dr. Hornaday's volume will serve admirably as a text book for furthering in other educational institutions the work that the Yale Forest School has inaugurated, or as a handy work of reference for the public in general. We can heartily recommend it as a valuable contribution to the cause with which Dr. Hornaday has for years been so closely identified.— W. S.

Hartert's 'Die Vögel der palaarktischen Fauna.' [2] — This installment covers the remainder of the Aquilidæ, including the Vultures and

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[1] Wild Life Conservation | in Theory and Practice | Lectures delivered before the Forest | School of Yale University | 1914 | By | William T. Hornaday, Sc.D. | Author of "The American Natural History," | "Our Vanishing Wild Life," etc.; | Ex-President of the American Bison Society | with a Chapter on | Private Game Preserves | By Frederic C. Walcott | *vignette* | New Haven: Yale University Press | London: Humphrey Milford | Oxford University Press | MDCCCCXIV. 8vo. pp. 1–240. Price, $1.50 net.

[2] Die Vögel der palaarktischen Fauna. Systematische Uebersicht der in Europa Nord-Asien und der Mittelmeer-region vorkommenden Vögel. Von Dr. Ernst Hartert. Heft IX (Bd. II. 3) seite 1089–1216 mit. 31 Abbildungen. Ausgegeben im Oktober, 1914. Berlin.

begins the Ciconiidæ. Only one new form appears, *Meliërax canorus neumanni* (p. 1165) Arbub, Mereau.— W. S.

Phillips on Experimental Studies of Hybridization among Ducks and Pheasants.[1]— The experiments here described were carried on during the past five years. The species involved were the Mallard, Pintail, Australian and East Indian Ducks; and the Ring-neck, Prince of Wales, Lady Amherst and Golden Pheasants, and the investigations deal mainly with the inheritance of male secondary sex characters.

In domestic birds a number of clearly Mendelizing characters have been demonstrated and sex-linked characters have also been described in canaries, pigeons and domestic fowls. In his experiments with wild species, however, Dr. Phillips found "a very different state of things." "Characters often apparently clear-cut and antagonistic do not segregate clearly." "There is some evidence that in closely related geographical races there is a nearer approach to orthodox Mendelism, but this is never reached, even in back crosses, except occasionally in isolated characters or in the more undifferentiated plumages of the female sex."

Dr. Phillips comes to the conclusion that it is almost certain that the ordinary subspecies of the ornithologist is very far from being a unit variation and that sex-linked inheritance is probably a feature of domestic races in birds. Indeed in species hybrids in almost every feather region the most minute detail of feather pattern and color show the influence of both parental races.

Dr. Phillips' paper is of great importance, showing what many students of systematic zoölogy have long felt, that it is not safe to assume that laws and principles of heredity demonstrated in domesticated strains of animals necessarily prevail in the case of wild species.

Too few of those engaged in experimental breeding have a proper training in systematic zoölogy to appreciate the nature of wild species, and we, therefore, especially welcome publications from an investigator so well informed on both sides of the problem as is Dr. Phillips.— W. S.

Allen on Pattern Development in Mammals and Birds.[2]— Dr. Allen has made a valuable contribution to the subject of coloration, a field by the way which opens up many possibilities for the ornithologist who may care to enter it. In the particular phase of the subject which he has been investigating — pattern development — he shows that pigmentation develops from certain centers, each one covering a very definite area. Loss of strength in a center of pigmentation and consequent failure to cover the entire area, results in a white or unpigmented line or space between this

[1] Experimental Studies of Hybridization among Ducks and Pheasants. By John C. Phillips. Jour. of Experimental Zool., Vol. 18, no. 1, January, 1915, pp. 69–112, ppl. 1–8.

[2] Pattern Development in Mammals and Birds. By Glover M. Allen. American Naturalist, 1914, pp. 385–412, 467–484, 550–566.

and the next area, producing a pied or a reticulated pattern. Such patterns, due to areal reduction, have, in wild species, often become fixed and a permanent part of the normal pattern. The development of such patterns has probably been very gradual, and it may be seen in process of development today in certain species in which the extent of white areas is quite variable — as the white neck patches of the Cackling Goose.

Dr. Allen also finds that the converse of this centripetal style of pigmentation is present in many species resulting in black pigmentation at the extremities — tip of nose, ears, tail or toes — or along primary breaks between pigmented areas. Furthermore the patches are physiologically independent of one another and may be differently colored in different individuals.

A careful study of Dr. Allen's paper will give us an intelligent idea of the apparently anomalous coloration of many domestic animals and when we become familiar with the locations of the various pigment centers, we see at once an explanation of many of the distributions of color in wild species, and why we find a constant duplication of general pattern or of prominent color patches in widely separated species.— W. S.

Shufeldt on the Skeleton of the Ocellated Turkey.[1]— Dr. Shufeldt here presents a detailed study of the skeleton of this interesting bird and compares it bone for bone with that of the more familiar turkey, *Meleagris gallopavo*. While he considers that the differences in the external characters of the two birds are sufficient to establish them in separate genera, he fails to find any notable difference in the skeletons, nothing indeed which would indicate more than specific differentiation.— W. S.

Smith's 'Handbook of the Rocky Mountain Park Museum'.[2]— This neatly printed little book is a guide to the Museum at Banff, Alberta. The ornithological portion contains the names of all species found within the limits of the park, with data for the specimens exhibited and special mention of those species which may be seen alive in the immediate vicinity of the museum. There is a full description of one species in each family, but it would seem that a general account of each family group would have been better in such a work. The species, so described, are elevated to undue importance in the popular mind over equally important species which are granted only nominal mention. We understand, however, that this is only a forerunner of a fuller edition and that these descriptions are devised for labels quite as much as for the users of the handbook. The framing of such a book so that descriptive labels may be printed off from the same type is an excellent idea.— W. S.

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[1] On the Skeleton of the Ocellated Turkey (*Agriocharis ocellata*) with notes on the osteology of other Meleagridæ. By R. W. Shufeldt. Aquila, Vol. XXI, 1914, pp. 1–52, pll. I–XIV, (Nov. 15, 1914). (In Hungarian and English.)

[2] Handbook of the Rocky Mountains Park Museum. By Harlan I. Smith. 8vo, pp. 1–126. Ottawa, 1914.

Mearns on New African Birds.[1]— The birds here described were obtained on the Frick, Rainey and Smithsonian African Expeditions, except one secured by Dr. W. L. Abbott in 1888. They are as follows: *Francolinus hildebrandti helleri* (p. 381) Mt. Lololokui; *Chalcopelia afra kilimensis* (p. 383) Mt. Kilimanjaro; *C. chalcospila intensa* (p. 384), Hawash River, Abyssinia; *C. c. media* (p. 385), Gardulla, Abyssinia; *Cinnyris venusta blicki* (p. 386), Lake Stephanie; *C. mediocris garguensis* (p. 387), Mt. Gargues; *C. reichenowi kikuyensis* (p. 388), Escarpment Sta.; *Chalcomitra senegalensis atra* (p. 388), Thika River; *Anthreptes collaris garguensis* (p. 389), Mt. Gargues; *Estrilda atricapilla keniensis* (p. 390), Aberdare Mts.; *Halcyon senegalensis cinereicapillus* (p. 391), Kisingo, Uganda; *H. malimbicus prenticei* (p. 392), Lake Victoria, Uganda; *Melittophagus variegatus loringi* (p. 393), Lake Albert, Uganda; *Colius striatus jebelensis* (p. 394), Gondokoro.

These forms are very fully described often with remarks upon allied races.— W. S.

Von Ihering on Brazilian Birds.[2]— Prof. von Ihering has been investigating the life histories, habits and structure of various groups of Brazilian birds in their bearing on the systematic arrangement of the genera. In a recent paper he takes up the cuckoos,[1] arranging them in six subfamilies, *Phœnicophainæ*, *Coccyzinæ*, *Centropinæ*, *Crotophaginæ*, *Scythropinæ*, and *Cuculinæ*. Incidentally he discusses the Brazilian birds which lay their eggs in the nests of other birds.

In another paper[3] he writes of the ornithological collection of the Museu Paulista and contributes some new observations on the nests and eggs of Brazilian birds, considering some 48 species. There is a fine colored plate of *Phylloscartes paulista* and *Guracava difficilis* and two other plates of nests and eggs.— W. S.

Allen's 'Birds in their Relation to Agriculture in New York State.'[4]— This little pamphlet is a veritable mine of information and its very conciseness will appeal to those who have not time to seek out their information from a number of more formidable publications, while it will undoubtedly carry home the principles of bird conservation to many who could not otherwise be reached.

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[1] Descriptions of New African Birds of the Genera Francolinus, Chalcopelia, Cinnyris, Chalcomitra, Anthreptes, Estrilda, Halcyon, Melittophagus, and Colius. By Edgar A. Mearns. Proc. U. S. Nat. Mus., Vol. 48, pp. 381–394. January 19, 1915.

[2] Biologia e Classificacao das Cuculidas Brasileiras. Por Hermann von Ihering. Revista Mus. Paulista, IX, pp. 371–410. July, 1914. (In Portuguese and German.)

[3] Novas Contribuicoes para a Ornithologia do Brazil. Por Hermann von Ihering. Revista Mus. Paulista, IX, pp. 411–488. August, 1914. (In Portuguese and German.)

[4] Birds in their Relation to Agriculture in New York State. By A. A. Allen. The Cornell Reading-Courses, IV, No. 76, November 15, 1914, pp. 17–56.

The half-tones from original photographs are excellent and varied. The common birds are considered under the convenient and rather novel headings of (1) 'bird and mammal eaters'; (2) 'fish, frog and crayfish eaters', including 'stalkers, plungers, divers'; (3) 'insect eaters',—'strainers, probers, scratchers, borers, gleaners'; (4) 'vegetable feeders',—seed eaters, fruit eaters. A convincing colored plate by L. A. Fuertes depicts the Horned Owl, Cooper's and Sharp-shinned Hawks devouring respectively a chicken, pigeon and robin, while the Marsh Hawk, Red-tailed Hawk and Barred Owl are feasting on meadow mice and a rat, and the Sparrow Hawk on a grasshopper. Dr. Allen has produced a valuable addition to the literature of bird protection, which could be reprinted for use in a much wider field with advantage.— W. S.

Simpson's 'Pheasant Farming'.[1]— This is a most attractive little brochure, illustrated by half-tones from photographs and drawings, and a colored plate by Bruce Horsfall. The chapter headings give a good idea of the contents: 'Propagation of Game Birds'; 'Varieties of Pheasants'; 'The Chinese Pheasant in Oregon'; 'Equipment for a Pheasant Farm'; 'The Ideal Mother for Pheasants'; 'Food for Young Pheasants'; 'Enemies of the Game Breeder'; 'Advice to Beginners'.

The demand for game and the absolute necessity of preventing the marketing of native species will make this industry of constantly increasing importance and this excellent little pamphlet will be in much demand.— W. S.

Recent Biological Survey Publications.— The ornithological activities of the Survey as set forth in the annual report of the chief, Mr. Henry W. Henshaw,[2] covered the food of Wild Ducks; the relation of birds to the Boll and Alfalfa Weevils and to the Range Caterpillar; the economic status of the Starling; and the general protection and attracting of birds and enforcement of the migratory bird law.

Mr. W. L. McAtee has prepared a timely report on 'How to attract Birds'[3] covering protection of grounds from cats, and the preparations of all sorts of feeding and shelter devices. There is also appended a valuable list of wild fruit and berry bearing trees and shrubs with their fruiting seasons. A report on the food of Robins and Bluebirds[4] by Prof. Beal sets forth in great detail the animal and vegetable food of these familiar birds as shown by the extended investigations of the Biological Survey.

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[1] Pheasant Farming. By 'Gene M. Simpson. Bull. No. 2, Oregon Fish and Game Commission, 1914.

[2] Report of Chief of Bureau of Biological Survey. By H. W. Henshaw. Advance Sheets from Annual Report of the Dept. of Agriculture for 1914 [Dec. 12, 1914], pp. 1–12.

[3] How to Attract Birds in Northeastern United States. By W. L. McAtee. Farmers Bulletin U. S. Dept. Agr. No. 621, Dec. 14, 1914, pp. 1–15.

[4] Food of the Robins and Bluebirds of the United States. By F. E. L. Beal. Bull. U. S. Dept. Agr. No. 171, Feb. 5, 1915. pp. 1–31.

In the case of the Robin the birds do no serious damage when their normal food supply is abundant, but in sections of New Jersey where the birds have been protected for years, they are constantly increasing, while the native berry bearing shrubs have been largely supplanted by domestic varieties. They are then very destructive to the berry crops and as Prof. Beal says: " Under such circumstances there is no doubt that a law allowing the fruit grower to protect his crop when attacked by birds would be proper." The Robin is similarly destructive to the olive plantations of California.

The examination of the Bluebird's food " fully justifies the high esteem in which the bird is held. It does not prey upon any product of husbandry or in any way render itself injurious or annoying." During the berry season of spring and early summer it feeds mainly upon insects, its fruit eating period being from late fall to early spring when waste fruit is available.

Prof. Cooke[1] describes the attempt to secure an estimate of the number of breeding birds in various sections of the country during 1914. The plan was the same as that outlined in the request for coöperation in a similar effort during 1915 which appears in ' Notes and News ' of the present issue of ' The Auk.'

The 1914 census showed the Robin to be the most abundant species in the Northeastern States, with the English Sparrow second, followed by the Catbird, Brown Thrasher, House Wren, Kingbird and Bluebird.— W. S.

Economic Ornithology in Recent Entomological Publications.— The most emphatic acknowledgement of the economic value of birds in any recent entomological paper is that of Mr. J. A. Hyslop in a bulletin on " Wireworms attacking cereal and forage crops," [2] who says, " Probably the most important factor in keeping wireworms in check are the birds." The significance of this statement is apparent from the authors estimate that wireworms are among the 5 worst pests of Indian corn, and among the 12 worst for wheat and oats. A list is given of 90 species of birds found by the Biological Survey to feed upon wireworms.

In a report on " The grasshopper problem and alfalfa culture," [3] Professor F. M. Webster states that " upward of 100 species of birds are known to feed to a greater or less extent upon grasshoppers, but probably the most useful in this direction are quails, prairie chickens, the sparrow hawk and Swainson hawk, the loggerhead shrike, all cuckoos, the cowbird, all blackbirds, and meadowlarks, the catbird, and the red-headed woodpecker."

The results of some original investigations by Messrs. R. N. and T. Scott Wilson of the bird enemies of the three cornered alfalfa hopper (*Sticto-*

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[1] Preliminary Census of Birds of the United States. By Wells W. Cooke. Bull. U. S. Dept. Agr. No. 187, Feb. 11, 1915, pp. 1–11.

[2] Bulletin 156, U. S. Department of Agriculture, Jan. 27, 1915, 34 pp.

[3] Farmers' Bulletin 637, U. S. Department of Agriculture, Jan. 25, 1915, 10 pp.

cephala festina) are presented by V. L. Wildermuth.[1] Thirty-one stomachs representing 8 species of Arizona birds were examined and specimens of the alfalfa hopper found in 10 stomachs. The species of birds eating this insect were the Killdeer, Black Phœbe, and Sonoran Red-winged Blackbird. A record for the Nighthawk is quoted from Biological Survey records.

Bird enemies of midges, especially the giant midge (*Chironomus plumosus*) are mentioned in various recent papers by A. C. Burrill.[2] The species of birds mentioned are the Tree Swallow, Barn Swallow, Kingfisher, Sandpipers, Red-winged Blackbird, English Sparrow, and Palm Warbler.

In his ninth report [3] as state entomologist of Minnesota, Professor F. L. Washburn, includes an article on "Useful Birds found in Minnesota." Paragraphs containing brief descriptions of appearance and habits, and the more important economic information about 21 species of birds form the bulk of the report. Discussion is included also of bad birds, birds of doubtful utility, and protection of planted corn from crows and other animals.— W. L. M.

Two Recent Papers on Bird Food by Collinge.— In "Some Observations on the food of nestling sparrows," [4] Professor W. E. Collinge presents a comparative study of the food of juvenile *Passer domesticus* taken in fruit-growing and in suburban districts. The report is based on examinations of more than 280 stomachs, and is a convincing demonstration of the powerful influence of availability in controlling the choice of food by birds. The illustration of this factor is the occurrence of kitchen refuse in 53 out of 87 stomachs of suburban sparrows, and in only one out of 200 birds collected in fruit-growing regions.

The results of the study, on the whole, are favorable to the sparrow. Professor Collinge "is of the opinion that if this species were considerably reduced in numbers, the good that it would do would probably more than compensate for the harm, especially in fruit-growing districts."

The second paper in hand is a brief summary of the economic importance of British Wild Birds.[5] The commoner species are classed in the following groups:

1. Distinctly injurious — House-sparrow, Bullfinch, Sparrow-hawk, Wood-pigeon, and Stock-dove.

2. Too plentiful, and consequently injurious — Missel Thrush, Blackbird, Greenfinch, Chaffinch, Starling, and Rook.

3. Injurious, but not plentiful — Blackcap.

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[1] Journal of Agricultural Research, Vol. III, No. 4, Jan. 15, 1915, p. 360.

[2] By the Wayside, Vol. 13, No. 7, March, 1912, pp. 50–51; Vol. 14, No. 6, February, 1913, p. 44; Bulletin Wis. Nat. Hist. Soc., Vol. X, Nos. 3–4, April 18, 1913, pp. 145–146; Vol. XI, Nos. 1–2, June, 1913, p. 66.

[3] Fifteenth Rep. State Entomologist of Minn., 1913–1914, pp. 1–19, Col. Pls. 1–3. Also issued as Circular No. 32.

[4] Journ. British Board of Agriculture, Vol. XXI, No. 7, October, 1914.

[5] Nature. Jan. 7, 1915.

4. Neutral—Jay.

5. Beneficial — Song Thrush, Fieldfare, White-throat, Great Tit, Blue Tit, Wren, Goldfinch, Linnet, Yellow Bunting, Magpie, Jackdaw, Skylark, Barn Owl, Brown Owl, Kestrel, and Plover.— W. L. M.

'First Report of the Brush Hill Bird Club.'[1]— The reviewer had the pleasure, in March, 1914, of inspecting a most interesting exhibit of materials for attracting birds. The well prepared report here cited puts into permanent form the valuable features of that exhibit. It discusses nesting boxes and their use, and tells where they can be obtained. Similar information is given for bird baths.

A collection of the seeds and fruits available to birds at the time of the bird show was an important and effectively arranged exhibit. The kinds are listed in the present report, and their value commented upon. Addresses are given of firms from whom various dried berries and grains can be purchased; also a list with publishers of the more important books, pamphlets and journals relating to birds.

National and State game laws are reprinted, and the relations of the bird club work to schools are emphasized. The report includes also a list, by Mr. Ralph E. Forbes, of birds seen in and about Milton during the years 1904 to 1914.

The striking success of the exhibit, which was open for two months and had an attendance of from 40 to 94 persons daily, and the usefulness of the 'First Report of the Brush Hill Bird Club' must be reckoned, in large part, personal achievements of the genial and energetic general manager, Dr. Harris Kennedy.— W. L. M.

Recent Reports on Game and Bird Protection.— The New Jersey Audubon Society presents a very creditable report[2] for the year 1914 and in Bulletin No. 9 makes an appeal for greater support and additional members which should be met by the bird lovers of the State. There is also an exquisite photograph of the Long-billed Marsh Wren and nest by Francis Harper illustrating an article on the second nesting of the species by Mary P. Allen.

Mr. W. L. Finley's attractive 'Oregon Sportsman'[3] continues to keep alive interest in game and bird protection in his State while the recently established 'California Fish and Game' edited by H. C. Bryant[4] does the same for the great commonwealth lying south of it. In the January number, Joseph Grinnell and the editor have an article on the Wood Duck in California.— W. S.

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[1] Milton, Mass., 1914, 123 pp., 6 pls., 1 map.

[2] Fourth Annual Report of the New Jersey Audubon Society. Oct. 6, 1914.

[3] The Oregon Sportsman. Wm. L. Finley, Editor. December, 1914, January, 1915.

[4] California Fish and Game. H. C. Bryant, Editor, Jan., 1915.

The Ornithological Journals.[1]

Bird-Lore. Vol. XVII, No. 1. January–February, 1915.

Bird-life in Southern Illinois. II. By Robert Ridgway.

The Story of a Red-tailed Hawk — Part 1. By Mrs. A. B. Morgan.

How Winter Thins Their Ranks. By J. W. Lippincott.

Migration Notes of N. A. Sparrows. By W. W. Cooke. Plumage notes by F. M. Chapman. Color Plate by L. A. Fuertes. This paper concludes the series.

Bird-Lore's Fifteenth Christmas Census, shows an increase in the number of reports as well as their thoroughness. Some editorial correction would seem warranted in such a case as that of the Chickadees since the record of both species in South Carolina, where only the Carolina is known, will prove confusing.

The Audubon department is full of interest while the Educational Leaflet treats of the Loon with a color plate by Brooks.

The Condor. Vol. XVI, No. 6. November–December, 1914.

A Forty-five Year History of the Snowy Heron in Utah. By A., E. and A. O. Treganza.

The effects of Irrigation on Bird Life in the Yakima Valley, Washington. By Clarence H. Kennedy.— An estimated increase of 60,000 birds.

Breeding of the Bronzed Cowbird in Arizona. By M. F. Gilman.

The Condor. Vol. XVII, No. 1. January–February, 1915.

With Rallus in the Texas Marsh. By G. F. Simmons.

The Nesting of the Black Swift. By W. L. Dawson.— Corroborating the breeding of the species at Santa Cruz.

The Kern Redwing — *Agelaius phœniceus aciculatus* subsp. nov. (p. 13). Isabella, Kern Co., Cal. By Jos. Mailliard.

The Status of the Arizona Spotted Owl. By H. S. Swarth.

Birds Observed on Forrester Island, Alaska During the Summer of 1913. By Harold Heath.

Birds of the Boston Mountains, Arkansas. By Austin P. Smith.

The Wilson Bulletin. Vol. XXVI, No. 4. December, 1914.

Notes on a Northern Robin Roost. By A. R. Abel.

The Birds of the Douglas Lake Region. By Jas. S. Compton.

A Hermit Thrush Study. By Cordelia J. Stanwood.

A Brief Study of the Nest Life of the Black-throated Green Warbler. By Cordelia J. Stanwood.

The Determination of the Food of Nesting Birds. By A. R. Cahn.

A Flight of Shore-birds near Youngstown, Ohio. By J. P. Young.

Corrections of the A. O. U. Check-List in Regard to Birds of Ohio. By W. F. Henninger.

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[1] The names of the editor and publisher of each journal will be found in the January number of 'The Auk.'

Nineteen Years of Bird Migration at Oberlin, Ohio. By Lynds Jones.

Discouraging the English Sparrow. By T. H. Whitney.

The Oölogist. Vol. XXI, No. 12. December 15, 1914.

A Great Flight of Grebes. By R. B. Simpson.— At Warren, Pa.

Nine Unusual and Interesting Experiences. By G. A. Abbott.— Nesting of Marbled Godwit, etc.

The Oölogist. Vol. XXII, No. 1. January 15, 1915.

Nesting of the Great Gray Owl in Central Alberta. By A. D. Henderson.

Numerous papers on nesting of other Owls.

Blue-Bird. Vol. VII, No. 4. January, 1915.

The Last Passenger Pigeon. By R. W. Shufeldt.— With a reproduction of a photograph of the head taken from the dead bird.

The Brown Creeper at Home. By Cordelia J. Stanwood.— With excellent photographs of nests and young and careful detailed study.

Farming Birds in Iowa. By Florence L. Clark.— Farms made into bird refuges by agreement of owners to allow nothing but predatory animals to be killed thereon.

The Ibis. X Series, Vol. III, No. 1. January, 1915.

On a Collection of Birds from British East Africa and Uganda, presented to the British Museum by Capt. G. S. Cozens. Part I. By Claude H. B. Grant.— The collection was made by Mr. Willoughby P. Lowe who accompanied Capt. Cozens, and the trip extended from September 21, 1912, to March 7, 1913, covering country between Naivasha and the German border and then northwest to the White Nile. The various geographic races are discussed and compared under each species.

A Recent Ornithological Discovery in Australia. By Gregory M. Mathews.— A geographic and historical discussion of the avifauna of northern Australia.

The Crested Penguin in Australian Waters. By H. Stuart Dove.

Report of the Birds collected by the late Mr. Boyd Alexander during his last Expedition to Africa — Part II. The Birds of St. Thomas' Island. By David A. Bannerman.— Sixty-five species.

Note on the Genus Ithagenes. By E. C. Stuart Baker.— Excellent colored plate of the heads.

A Few Notes on *Tetrao urogallus* and its Allies. By Collingwood Ingram.— *T. u. aquitanicus* subsp. nov. (p. 132) from the Pyrenees.

Notes on the Bird Life of Eastern Algeria. By Rev. F. C. R. Jourdain.— With Contributions by H. M. Walles and F. R. Ratcliff — 197 species listed.

Bulletin of the British Ornithologists' Club. No. CCI. November 24, 1914.

Messrs. Rothschild and Hartert (p. 24) describe *Ceyx solitaria mulcata* subsp. nov., New Hanover.

Mr. D. A. Bannerman discusses the birds of the islands of the Gulf of Guinea.

Mr. Claude Grant describes *Scopus umbretta bannermani* subsp. nov.

(p. 27), Mt. Leganisho, B. E. A., also *Halycon leucocephala ogilviei* subsp. nov. (p. 28), So. Angoniland, Nyasaland and *H. senegalensis superflua*, subsp. nov. (p. 28), Limpopo R., Transvaal.

Bulletin of the British Ornithologists' Club. No. CCII.

Messrs. Rothschild and Hartert describe *Dicæum geelvinkianum rosseli* (p. 32), Rossel Island, Louisiade Group.

Dr. Hartert describes *Callisitta azurea expectata* (p. 34), Pahang, Malay Peninsula, Mr. Ogilvie-Grant, *Collocalia hirundinacea excelsa* (p. 34), *C. esculenta maxima* (p. 35), and *C. nitens* (p. 35), all from the Utakwa River, Snow Mts. of New Guinea.

Bulletin of the British Ornithologists' Club. No. CCIII.

Hon. Walter Rothschild discusses the nomenclature and relationship of the "Masked Gannets." He concludes that the name *Sula dactylatra* should be used instead of *S. cyanops* and recognizes five subspecies of which *S. d. californica* (p. 43) is described as new from San Benedicto Island, the form ranging along the Californian and Central American coasts.

Mr. W. L. Sclater points out that the type of the genus *Sula* is *Sula sula* Brisson — *S. leucogastra* Bodd. He also contributes some short biographical notices of Bonaparte, Gould, Strickland and Jardine.

Mr. D. A. Bannerman describes *Poliolais alexanderi* (p. 53) from Cameroon and *Zosterops stenocricota poensis* (p. 54), Fernando, Po.

Mr. Claude H. B. Grant proposes *Centropus superciliosus loandæ* (p. 54) Dalla Tando, Angola; *C. s. sokotræ*, (p. 55), Sokotra; and *Melittophagus variegatus bangweoloensis* (p. 55) Lake Bangweolo, N. E. Rhodesia.

Bulletin of the British Ornithologists' Club. Vol. XXXIV.

This volume of 344 pages consists of the Migration Report for the spring of 1913 and autumn of 1912. It follows the plan of the preceding reports and contains an enormous amount of detailed information. Reports were received from 327 observers and light keepers. The Committee which tabulated the data recognize several distinct immigrations across the channel from France. In the case of the Cuckoo these occurred April 14–16, April 19–24 and April 27–May 1.

British Birds. Vol. VIII, No. 7. December 1, 1914.

Feeding-habits of the Sparrow Hawk. By W. Farron.

The 'British Birds' Marking Scheme. Progress for 1914 and Some Results. By H. F. Witherby.— A most interesting report.

British Birds. Vol. VIII, No. 8. January 1, 1915.

Notes on the Breeding-Habits of the Curlew Sandpiper. By Maud D. Haviland.— At the mouth of the Yenesei River.

A Practical Study of Bird Ecology. By H. G. Alexander.

British Birds. Vol. VIII, No. 9. February 1, 1915.

Notes on the Breeding-Habits of the Little Stint. By Maud D. Haviland.— At Golchika, mouth of the Yenesei.

Report on the Results of Ringing Black-Headed Gulls. By H. W. Robinson.— During the years 1909–1913, 11,769 of these Gulls were banded in the nest. Of these 414 have been recovered.

Avicultural Magazine. Vol. VI, No. 2. December, 1914.

Cranes in Captivity. Edit.

The Pigeon Hollandais. By Graham Renshaw.— Historical account of *Alectroenas*.

Weavers. By W. Shore Baily.— Photograph of nests in his aviary.

English Names for the Parrots. By Dr. E. Hopkinson.— A convenient compilation, continued in Nos. 3 and 4.

Avicultural Magazine. Vol. VI, No. 3. January, 1915.

Birds of Paradise on Little Tobago. By O. Millsum.— The birds are still doing well.

Avicultural Magazine. Vol. VI, No. 4. February, 1915.

My Hummingbirds and How I Obtained Them. By A. Ezra.— Interesting account of exportation and successful keeping of several West Indian Species.

Bird Notes. Vol. V, No. 11. November, 1914.

A Journey Across the Sierras. By W. S. Baily (continued).— Mr. Baily's amusing disregard of the published information on American birds is still in evidence. Of *Pica nuttalli* he tells us he has seen a good many in the Rocky Mts. in Utah and Wyoming! In the December number is a continuation in which we are informed of the presence of the "White-eyed Grackle (*Quiscalus quiscalus agelæus*)" in the Santa Clara Valley — surely a new species for California!!

Bird Notes. Vol. VI, No. 1. January, 1915.

Foreign Birds at the Show. By W. T. Page.— A plate of interesting hybrid Weavers, Finches and Bulbuls.

The Austral Avian Record. Vol. II, No. 6. December 19, 1914.

On the Species and Subspecies of the genus *Fregata*. By G. M. Mathews. — The bird of Ascension Island upon which the name *Pelecanus aquilus* of Linnæus is based proves to be quite distinct from the common widely distributed form which must be known as *Fregata minor* Gm. Eight subspecies of this bird are proposed and two of *F. ariel*, the form of the A. O. U. Check-List is true *minor*.

The Austral Avian Record. Vol. II, No. 7. January 28, 1915.

Additions and Corrections to my List of the Birds of Australia. By G. M. Mathews.— Two new genera and 57 new subspecies or species are described.

Notes on Some Australian Types. By G. M. Mathews.

Diggles' Ornithology of Australia and Other Works. By G. M. Mathews. — Seven species described in the 'Transactions of the Philosophical Society of Queensland' were from the Aru Islands, not from Australia.

The Dates of Publication of Vieillot's Galerie des Oiseaux. By G. M. Mathews.

The South Australian Ornithologist. Vol. II, Part 1. January, 1915.

Notes on some of the Birds observed on Mount Dandenong, Victoria, October, 1914. By Edwin Ashby.

Birds of the Cairns District, Queensland. No. 1. By G. M. Mathews.

A Sketch of the Life of Samuel White. By S. A. White.

Ornithologisches Jahrbuch.[1] XXV, Heft 3–4. May–August, 1914, (October 27, 1914.) [In German.]

Review of Bird Migration in Ascania Nova, Taurien Govt., Southern Russia. By H. Grote.

On the Birds of the Irkutsk Govt. By H. Johansen.— *Hypotriorchis subbuteo irkutensis* (p. 83) subsp. nov. Dorfe Omoloi (Kreis Kirensk).

Remarks and Criticisms on Publications on Certain Species of Birds of the Canaries. By R. von Thanner.

Journal für Ornithologie.[2] 62, Heft 4. October, 1914. [In German.]

The Phylogeny of the Thrushes. By J. Gengler (concluded).

Contributions to the Ornithology of Prussian Schlesia. By C. Keyser (concluded).

Birds of the Middle Kergisensteppe. By P. P. Suschkin (concluded).

South Somaliland as a Zoogeographic Division. By O. Graf Zedlitz.— List of 98 species (continued in January number to 194 species).

Journal für Ornithologie. 63, Heft 1. January, 1915.

Some New Forms of Central African Birds in the Grauer Collection. By Moriz Sassi.— *Hyliota slatini* (p. 112), Beni; *Phyllastrephus lorenzi* (p. 112), Moera; *Geocichla princei graueri* (p. 113), Moera; *G. gurneyi oberländeri* (p. 115), Beni-Mawambi; *G. g. tanganjicae* (p. 116), Urwald; *Cossypha bocagei albimentalis* (p. 117), Urwald.

On a Small Collection of Birds from Northern Mesopotamia. By O. Neumann.

New Species. By A. Reichenow.— *Oreopsittacus arfaki intermedius* (p. 124), New Guinea; *Centropus senegalensis tschadensis* (p. 124), Tschad district, Central Africa; *Aethomyias nigrifrons* (p. 124), New Guinea; *Micræca poliocephala* (p. 124), New Guinea; *Pachycephala hypoleuca* p. 125), New Guinea; *Melanorhectes umbrinus* (p. 125), New Guinea; *Ploceus melanolæma* (p. 125), Fernando Po.; *Zosterops setschuana* (p. 125), Ta-tsieng-lu-ting in Setschuan; *Cleptornis palauensis* (p. 125), Palau; *Melirrhophetes rufocrissalis* (p. 126), New Guinea; *Melilestes chloreus* (p. 126), New Guinea; *Philemonopsis meyeri canescens* (p. 126), New Guinea; *Ptilotis simplex* (p. 126), New Guinea; *Xanthotis chlorolæma* (p. 127), New Guinea; *X. melanolæma* (p. 127), New Guinea; *Thelazomenus* n. gen. (p. 127), allied to *Xanthotis*, type *T. pœcilocercus* (p. 127), New Guinea; *Chalcomitra adamauæ* (p. 127), Adamaua; *C. tanganjicæ* (p. 128), Urwald; *Phyllastrephus leucolæma camerunensis* (p. 128), Duma, Cameroons. *Camaroptera caniceps* (p. 128), Duma; *Crateroscelis virgata* (p. 128), New Guinea; *C. albigula* (p. 128), New Guinea; *Pseudopitta* n. gen. (p. 129) type *Eupetes incertus* Salvad; *Crateropus jardinei hypobrun-*

[1] Edited by Victor Ritter Tschusi zu Schmidhoffen, Hallein, Salzburg Austria.

[2] Edited for the German Ornithological Society by Dr. A. Reichenow. L. A. Kittler, Leipzig, Agent.

neus (p. 129), Amadi, Congo dist.; *Bradornis pallidus tessmanni* (p. 129), Carmot, E. Cameroon.

On *Pelecanus sharpei*. By A. Reichenow.

Ornithologische Monatsberichte. Vol. 22, No. 10–11. October–November, 1914. [In German.]

Emberiza melanocephala Scop. and its division into two races.— *E. m. orientalis* sp. n., (p. 159) Eastern Sarpa-steppe.

Description of a New Weaver-bird from Abyssinia. By J. v. Madarasz. — *Othyphantes edmundi* (p. 161).

Ornithologische Monatsberichte. Vol. 22, No. 12. December, 1914.

Ornithological Observations on a Trip through Uhehe and Ubena [Africa]. By L. Schuster.

Messager Ornithologique.[1] V, No. 3. 1914. [In Russian.]

Contributions to the Ornithology of the Tomsk Govt. By H. Johansen (continued from 1912, No. 4).

The Species and Races of Remiza of Russian Turkestan. By N. A. Sarudny.

Messager Ornithologique. V, No. 4. 1914. [In Russian.]

An Ornithological Excursion in Eastern Transcaucasia. By W. W. Stantschinsky.

A New Pheasant from Turkestan. By N. A. Sarudny.— *Phasianus mongolicus bergii* subsp. nov. (p. 277).

An Unnamed Saxicola. By N. A. Sarudny.— *S. finschii neglecta* subsp. nov. (p. 279).

On the Avifauna of Transcaucasia. By P. W. Nesterow (continued from 1913, No. 3).

On the Rosy Finch of Turkestan. By N. A. Sarudny.

A Hybrid between *Nyroca ferina* and *N. nyroca*. By N. A. Sarudny.

Messager Ornithologique. VI, No. 1. 1915. [In Russian.]

Pages 5–8 contain a convenient list of the new names proposed in the 'Messager', 1910–1914, consisting of 1 genus, 2 species and 55 subspecies.

On the Avifauna of the Ussuri country. By G. J. Poljakow.— *Perdix daurica suschkini* subsp. nov. (p. 38); *Bubo bubo ussuriensis* subsp. nov. (p. 44).

Contributions to the Ornithology of Turkestan. By N. A. Sarudny (continued from 1913, No. 4).

Some Remarks on the Geographic Distribution of *Cyanistes cyanus* and on the Origin of *C. pleskei* Cab. By J. Domaniewski.

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[1] Edited by G. I. Poljakow, Gut. "Sawino," Oberalowka, Moscow Govt., Russia.

Ornithological Articles in Other Journals.[1]

Galloway, A. R. and **Thomson,** A. L. Notes on High Mortality among Young Common Terns in Certain Seasons. (Scottish Naturalist, December, 1914.) — On the Scottish coast.

Clyve, Robert. Notes on Birds Observed at the Butt of Lewis [Hebrides]. (Scottish Naturalist, February, 1915.)

Taverner, P. A. Geological Survey Museum Work on Point Pelee, Ont. (Ottawa Naturalist, November, 1914.) — Largely ornithological.

Allen, Arthur A. The Paramo of Santa Isabel. (Amer. Museum Jour., January, 1915.)

The Roosevelt-Rondon Scientific Expedition. By L. E. Miller. (Amer. Museum Jour., February, 1915.) — This and the preceding give accounts of two of the American Museum's recent expeditions.

Clark, A. H. Distribution of the Onychophora. (Smithson. Misc. Coll. 65, No. 1, Jan. 4, 1915.) — Pages 6–8 discuss the question of primary and secondary colonization in migratory birds, the latter being exemplified in species which have spread from the tropics to summer in temperate regions, by individuals which revert and breed sporadically in the tropics.

Yerkes, R. M. Color Vision in the Ring-Dove (*Turtur risorius*). (Proc. Nat. Acad. Sci., I, No. 2, pp. 117–119.)

Brother Alphonsus. Distribution of Our Birds in Spring and in Winter. (Amer. Midland Naturalist, January, 1915.) — Comparisons of several seasons based on the number of times each species was recorded. As there are no data as to the amount of time or the number of days devoted to observation, the results are rather unsatisfactory.

Bartsch, Paul. Birds Observed in the Florida Keys, April 20–30, 1914. (Year Book, No. 13, Carnegie Inst. of Washington, pp. 192–195.) — A brief diary of observations and a nominal list of 47 species.

Wormald, Hugh. Courtship of Ducks and Notes on Hybrids with Illustrations. (Trans. Norfolk and Norwich Nat. Sci. Soc., IX, pt. V, pp. 693–701.)

Anon. Wild Birds Protection in Norfolk, 1914. (do. pp. 765–769.)

Riviere, B. B. Notes on the Autumn Migration on the Norfolk Coast. (do. pp. 770–773.)

Gurney, J. H. The Irruption of Waxwings into Norfolk during the Winter of 1913–14. (do. pp. 773–775.)

Long, S. H. and **Riviere,** B. B. Fauna and Flora of Norfolk. Additions to Part XI. Birds (Sixth List). (do. pp. 784–797.)

Baker, E. C. Stuart. The Game Birds of India, Burma and Ceylon.

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[1] Some of these journals are received in exchange, other are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

(Jour. Bombay Nat. Hist. Soc., November, 1914, pp. 183–196.) — Two beautiful colored plates of Sand Grouse.

Stevens, H. Notes on the Birds of Upper Assam (do.) — A well annotated list containing in the present installment 243 species. The preservation of the original form of a word is carried to the extreme of refusing to change the termination of the specific name to agree with the gender of the genus!

Harrington, H. H. Notes on the Indian Timeliides and their Allies (continued). (do. pp. 311–340.) — A careful discussion of the relationship of the genera and species, with descriptions and distribution. The following new forms are proposed: *Trochalopterum erythrocephalum woodi* (p. 317) Burma; *Pomatorhinus horsfieldi trancoreensis* (p. 333), Peermall, S. India; *P. ruficollis bakeri* (p. 336), Shillong.

Baker, E. C. Stuart. On a Small Collection of Birds from the Meshmi Hills, N. E. Frontier of India. (Records of the Indian Museum, IX, pt. V, pp. 251–254.) — A list of ten species containing much information on *Ithaginis cruentus kuseri.*

Wait, W. E. The Distribution of Birds in Ceylon and its Relation to recent Geological Changes in the Island. (Spolia Zeylanica, X, December, 1914, pp. 1–32.) — An important paper consisting of detailed data on distribution upon which generalizations are based. Of the two faunal divisions of Ceylon, the Northern tract which is allied to the Carnatic area of the Indian peninsula, contains absolutely identical species; but the relation of the Southern Hill tract to the Malabar Coast is more remote, consisting only in " close correspondence of type."

Warren, E. A Case of Hybridism among Cockatoos. (Annals Natal Mus. III, pp. 7–28, pl. III, September, 1914.) — A male *Cacatua galerita* mated with a female *Licmetis nasica* and two hybrids were reared. They showed an intimate mixture of characters and no simple Mendelian relationship was exhibited. A considerable discussion of hybrids between wild species with relation to Mendelism follows.

Benham, Professor. The Nomenclature of the Birds of New Zealand: being an Abstract of Mathew's and Iredale's Reference List. (Trans. & Proc., New Zealand Inst., XLVI, pp. 188–204.)

Philpott, Alfred. Notes on the Birds of Southwestern Otago. (do. pp. 205–212.)

Hill, H. The Moa-Legendary, Historical and Geological: Why and when the Moa disappeared. (do. pp. 330–351.)

Magnan, M. A. On the Length of the Tail and the Acuteness of the Wing in Birds. (Bull. Mus. Nat. Hist. Nat. Paris, 1913, No. 8, pp. 622–631.) [In French.]

Raspail, Xavier. Ornithological Observations made on the Belgian Coast, 1877–78. [In French.]

Tschusi zu Schmidhoffen, Viktor Ritter. Ornithological Gleanings from Austro-Hungary. (Zool. Beobachter, LV, Nos. 9–11, pp. 236–243, 291–297, September and November, 1914.) [In German.]

Wild Life. Dec., 1914, Jan., 1915, contains beautiful photographic reproductions of Willow Warblers, Coots, Spoonbills, Ravens, Pied Wagtail and of the Rhinoceros covered with "Rhino birds," *Buphagus erythrorhyncha.*

Trouessart, E. The Influence of the War on the fauna of the Country and the Migration of Birds. (La Nature, Ann. 43, No. 2155, pp. 33–35.) [In French.]

Tischler, F. Die Vögel der Provinz Ostpreussen. (W. Junk Berlin, 1914, royal 8vo., pp. 1–331.) — Treats of 305 species and subspecies. Historical preface with plate of prominent ornithologists of the region. [In German.]

Publications Received.— Allen, A. A. (1) Birds in their Relation to Agriculture in New York State. (The Cornell Reading-Course, Vol. IV, No. 76. Nov. 15, 1914.) (2) The Paramo of Santa Isabel. (Amer. Mus. Jour., XV, Jan. 1915, pp. 3–8.)

Allen, Glover M. Pattern Development in Mammals and Birds. (Amer. Nat., 1914, pp. 385–412, 467–484, 550–566.)

Beal, F. E. L. (1) Some Common Birds Useful to the Farmer. (U. S. Dept. Agr., Farmers' Bull. 630, Feb. 13, 1915.) (2) Food of the Robins and Bluebirds of the United States. (Bull. U. S. Dept. Agr., 171, Feb. 5, 1915.)

Brabourne, Lord, and Chubb, Charles. (1) A Key to the Species of the Genus *Crypturus* with Descriptions of some new Forms. (Ann. and Mag. Nat. Hist., Ser. 8, Vol. XIV, Oct., 1914, pp. 319–322.) (2) A Synopsis of the Genus *Tinamus.* (do. Vol. XII, Dec., 1913, pp. 577–579.)

British Ornithologists' Union Committee. A List of British Birds. Second and Revised Edition. London, 1915. Wm. Wesley & Son. Price 7s. 6d.

Buckland, James. The Value of Birds to Man. (Smithson. Rept. for 1913, pp. 439–458.)

Clark, Austin H. The Present Distribution of the Onychophora, a Group of Terrestrial Invertebrates. [Distribution of birds discussed.] (Smithson. Misc. Coilns., 65, No. 1. Jan. 4, 1915.)

Cleaves, Howard H. What the American Bird Banding Association has Accomplished During 1912. (Smithson. Rept. for 1913, pp. 469–479.) (Reprinted from 'The Auk.')

Cooke, Wells W. Preliminary Census of Birds of the United States. (Bull. U. S. Dept. Agr., 187, Feb. 11, 1915.)

Grinnell, Joseph. Barriers to Distribution as Regards Birds and Mammals. (Amer. Nat., XLVIII, April, 1914, pp. 248–254.)

Hankin, E. H. Animal Flights: A Record of Observation. Iliffe & Sons, Ltd. London [1913?]. Price 12s 6d. net.

Henshaw, Henry W. Report of the Chief of Bureau of Biological Survey. (Advance sheets from Ann. Repts., U. S. Dept. Agr., 1914.)

Hornaday, William T. Wild Life Conservation in Theory and Practice. Yale Univ. Press., New Haven, Conn., 1914. Price $1.50.

Huxley, Julian S. (1) The Courtship-Habits of the Great Crested Grebe (*Podiceps cristatus*): with an Addition to the Theory of Sexual Selection. (Proc. Zool. Soc. London, Sept., 1914, pp. 491–562.) (2) A "Disharmony" in the Reproduction Habits of the Wild Duck (*Anas boschas*, L.) (Biol. Centralbl., XXXII, No. 10, Oct. 20, 1912.)

Ihering, Hermann von. (1) Biologia e Classificacao das Cuculidas Brasileiras. (Revista Mus. Paulista, IX, July, 1914, pp. 371–410.) (2) Novas Contribuicoes para a Ornithologia do Brazil. (do. Aug., 1914, pp. 411–488.)

McAtee, W. L. How to Attract Birds in Northeastern United States. (Farmers' Bull., 621, U. S. Dept. Agr., Dec. 14, 1914.)

Mailliard, Joseph. The Kern Redwing — *Agelaius phœniceus aciculatus.* (The Condor, XVII, pp. 12–15, Jan., 1915.)

Mearns, Edgar A. Descriptions of New African Birds of the Genera Francolinus, Chalcopelia, Cinnyris, Chalcomitra, Anthreptes, Estrilda, Halcyon, Melittophagus, and Colius. (Proc. U. S. Nat. Mus., 48, pp. 381–394, Jan. 19, 1915.)

Murphy, Robert Cushman. A Report on the South Georgia Expedition. (Science Bull., Mus. Brooklyn Inst., Vol. 2, No. 4, Nov. 5, 1914.)

National Association of Audubon Societies, Inc. Tenth Annual Report. (Bird-Lore, 1914, pp. 481–565.)

New Jersey Audubon Society. Fourth Annual Report.

Phillips, John C. Experimental Studies of Hybridization Among Ducks and Pheasants. (Jour. Exper. Zool., Vol. 18, No. 1, Jan., 1915, pp. 69–112.)

Sherman, Althea R. Experiments in Feeding Hummingbird Birds During Seven Summers. (Smithson. Rept. for 1913, pp. 459–468.) (Reprinted from the 'Wilson Bulletin,' 1913.)

Shufeldt, R. W. (1) On the Skeleton of the Ocellated Turkey (*Agriocharis ocellata*) with notes on the osteology of other Meleagridæ. (Aquila, Vol. XXI, 1914, pp. 1–52.) (2) Review of the Wild Geese of North America, Part I. (Outers' Book, Feb., 1915.) (3) New Light on the Great Toothed Divers of America. (Sci. Amer., Jan. 23, 1915.)

Simpson, 'Gene M. Pheasant Farming. (Bull. 2, Oregon Fish and Game Com.)

Smith, Harlan I. Handbook of the Rocky Mountains Museum. Ottawa, 1914.

Snethlage, Dr. Emilia. Catalogo das Aves Amazonicas contendo todas as especies descriptas e mencionadas até 1913. (Boletim do Mus. Gœldi, Vol. VIII, Para Brazil, 1914.

Taverner, P. A. A New Species of Dendragapus (*Dendragapus obscurus flemingi*) from Southern Yukon Territory. (Mus. Bull. No. 7, Canadian Geol. Survey, Dec. 20, 1914.) (Reprinted from 'The Auk.')

Abstract Proc. Zool. Soc. London, Nos.

American Museum Journal, The, XIV, No. 8, December, 1914; Nos. 1 and 2, January and February, 1915.

Austral Avian Record, Vol. II, Nos. 6–7, December 19, 1914, and January 28, 1915.

Australian Museum, Records, Vol. X, No. 10, October 31, 1914. Report for year ending June 30, 1914.

Avicultural Magazine, (3) VI, 2–4, December, 1914–February, 1915.

Bird Lore, XVII, No. 1, January–February, 1915.

Bird Notes and News, Vol. VI, No. 4, Winter, 1914.

Blue-Bird, Vol. VII, Nos. 3–4, December, 1914–January, 1915.

British Birds, VIII, Nos. 7–9, December, 1914–February, 1915.

Bulletin British Ornith. Club, Nos. CCI–CCIII, November 24, December 29, 1914; and January 27, 1915. Vol. XXXIV, December, 1914.

Bulletin of the Charleston Museum, X, No. 8, December, 1914. XI, No. 1, January, 1915.

California Fish and Game, I, No. 2, January, 1915.

Condor, The, XVI, No. 6, November–December, 1914, Vol. XVII, No. 1, January–February, 1915.

Forest and Stream, LXXXIII, Nos. 25–26. LXXXIV, Nos. 1 and 2.

Ibis, The, (10) III, No. 1, January, 1915.

Messager Ornithologique, 1914, No. 3, 4: 1915, No. 1.

Michigan Game, Fish and Forestry Warden, Annual Report, 1913–1914.

New Jersey Audubon Bulletin, No. 8, January, 1915.

Oölogist, The, XXXII, Nos. 1, 2, January and February, 1915.

Oregon Sportsman, The, II, No. 12, December, 1914. III, No. 1, January, 1915.

Ornithologisches Jahrbuch, XXV, Heft 3–4, May–August, 1914.

Ottawa Naturalist, The, XXVIII, Nos. 8–10, November, 1914–January, 1915.

Proceedings of the Acad. Nat. Sci. Philadelphia, LXVI, Pt. 3, September–December, 1914.

Proceedings Nat. Acad. Sci., I, Nos. 1 and 2, January and February, 1915.

Proceedings of the Nebraska Ornithologists' Union, Vol. VI, Pt. 1 and 2, February, 1915.

Revista do Museu Paulista, Vol. IX, Sao Paulo, Brazil.

Science, N. S., XL, Nos. 1042–1053; XLI, Nos. 1044–1055.

Scottish Naturalist, The, Nos. 36–38, December, 1914–February, 1915.

South Australian Ornithologist, II, Part 1, January, 1915.

Wilson Bulletin, The, XXVI, No. 4, December, 1914.

Zoologist, The, (4) XVIII, No. 216, December, 1914. XIX, No. 217, January, 1915.

CORRESPONDENCE.

A Bird Census of the United States.

EDITOR OF 'THE AUK':

Dear Sir: A preliminary census of the birds of the United States was undertaken by the Bureau of Biological Survey during the spring of 1914. The results were so encouraging that the work is to be repeated in the spring of 1915 on a larger scale, and will probably be repeated yearly hereafter in order to obtain permanent records showing the fluctuations in the bird population of the United States. Observers are particularly desired in the West and South and it is hoped that the readers of 'The Auk' will be able to render valuable assistance in the campaign for the coming season. Anyone familiar with the birds nesting in his neighborhood can help, more particularly as only about the equivalent of one day's work is needed.

The general plan is to select an area containing not less than 40 nor more than 80 acres that fairly represents the average conditions of the district with reference to the proportions of plowed land, meadowland, and woods, and go over this selected area early in the morning during the height of the nesting season and count the singing males, each male being considered to represent a nesting pair. In the latitude of Washington, D. C., the best time is the last week in May; in the South the counting should be done earlier; while in New England and the northern part of the Mississippi Valley about June 10 is the proper time. The morning count should be supplemented by visits on other days to make sure that all the birds previously noted are actually nesting within the prescribed area and that no species has been overlooked.

Readers of 'The Auk' and others who are willing to volunteer for this work are requested to send their names and addresses to the Biological Survey, Washington, D. C. Full directions for making the census and blank forms for the report will be forwarded in time to permit well considered plans to be formulated before the time for actual field work. As the Bureau has no funds available for the purpose, it must depend on the services of voluntary observers.

Very truly yours,

U. S. Dept. Agr.
Feb. 16, 1915.

E. W. NELSON.
Assistant Chief, Biological Survey.

[It is to be hoped that the readers of 'The Auk' will respond promptly to Mr. Nelson's appeal. The Biological Survey has done so much for both birds and bird students throughout the country that this request for coöperation should meet with a hearty response.— ED.].

NOTES AND NEWS.

Louis di Zerega Mearns, formerly an Associate of the American Ornithologists' Union, died of diphtheria at the Sydenham Hospital, Baltimore, Maryland, April 3, 1912. He was born at Fort Verde, in central Arizona, November 5, 1886. He was graduated from the Rensselaer Polytechnic Institute, at Troy, New York, in the class of 1909, with the degree of C. E. After graduating from the Institute he spent a year and a half at the Dudley Southern Observatory, at San Luis, Argentine Republic, and after his return from South America, he was employed for some time in the observatory at Albany, New York. Shortly before his death he accepted a position with the Baltimore Sewerage Commission.

Throughout his life he was deeply interested in nature studies and was especially devoted to biology. His observations were recorded with fidelity and clearness. In the field he was a delightful companion, an accurate and quick shot with shotgun or rifle, and a clever and successful mammal trapper. He began a collection of plants when four years old, and collected his first mammal at Fort Snelling, Minnesota, May 18, 1891, sending the latter to Dr. J. A. Allen, who acknowledged the little white-footed wood-mouse as coming from the youngest contributor to the mammal collection of the American Museum of Natural History. Mr. Mearns's specimens were of excellent quality, carefully recorded, with detailed measurements. For many years his collection was stored in the United States National Museum, at Washington; but, about a year before his death, it was donated to the museum, to which it forms a valuable addition.

Although much interested in the study of botany, the few published writings that he has left relate solely to mammals and birds. Following is a complete list of his biological publications:

1. On the Occurrence of the genus Reithrodontomys in Virginia. The American Naturalist, vol. 31, February 1, 1897, p. 161.

2. Notes from Newport. Notes on Rhode Island Ornithology, vol. 1, No. 3, July, 1900, pp. 13–15.

3. Spring Arrival and Departure Notes, 1900. Notes on Rhode Island Ornithology, vol. I, No. 3, July, 1900, p. 18.

4. Birds observed at Chepachet, R. I. Notes on Rhode Island Ornithology, vol. I, No. 4, October, 1900, pp. 21, 22.

5. Notes from Newport, R. I. Notes on Rhode Island Ornithology, vol. I, No. 4, October, 1900, p. 22.

6. Arrival and Departure Notes, 1900. Notes on Rhode Island Ornithology, vol. I, No. 4, October, 1900, p. 22.

7. Arrival and Departure Notes, 1900. Notes on Rhode Island Ornithology, vol. II, No. 1, January, 1901, p. 8.

8. Birds Observed on Prudence Island, Narragansett Bay, Rhode Island. Notes on Rhode Island Ornithology, vol. II, No. 4, October, 1901, pp. 18–19.

9. A List of the birds Observed on the Island of Rhode Island and the Adjacent Waters. Notes on Rhode Island Ornithology, vol. III, No. 2, April, 1902, pp. 6–12; vol. III, No. 3, July, 1902, pp. 13–14; vol. III, No. 4, October, 1902, pp. 17–23.

10. The Louisiana Water-Thrush in Minnesota. The Auk, vol. XX, No. 3, July, 1903, pp. 307–308.— EDGAR A. MEARNS.

THREE years ago 'Recent Literature' in 'The Auk' was extended to include a brief review of the ornithological magazines and ornithological articles in other periodical publications, beginning with January 1, 1912. Space usually allows only a quotation of the titles of the more important articles and a citation of the new forms proposed. Even this, however, enables the reader to consult all the publications bearing upon his special line of work, while the index to the volumes will contain references to practically all the new species described by ornithologists, in every part of the world.

The resources of the library of the Academy of Natural Sciences of Philadelphia render it possible to make this record nearly complete and it is interesting to check up the list of new forms recorded for 1912 in 'The Auk' with those catalogued in the 'International Catalogue of Scientific Literature.' The vast number of Australian genera, species and subspecies proposed by Mr. Gregory M. Mathews were not listed in 'The Auk' although all of his papers are noticed. One paper by Mr. Robert Ridgway containing 14 new genera, published in the 'Proc. Biol. Soc. of Washington,' was not sent to 'The Auk' and was overlooked, as it was presumed that all ornithological publications of this society had been received for review. Outside of this only nine new names were missed, two of which were in publications which did not reach either 'The Auk' or the Academy library. The benefit of having these new species, etc., listed, usually within three months of the time of publication, instead of waiting nearly two years for the appearance of the 'International Catalogue' is, we trust, worth the labor of compilation.

ON the evening of January 7, 1915, the Delaware Valley Ornithological Club celebrated the twenty-fifth anniversary of its founding with an informal dinner at The Roosevelt, Philadelphia. Sixty-six members and eight guests were present; Stewardson Brown, president of the Club, presided, and Dr. Spencer Trotter acted as toastmaster. The speakers were, Dr. A. K. Fisher and John H. Sage, president and secretary of the A. O. U.; Charles F. Batchelder representing the Nuttall Ornithological Club of Cambridge; John T. Nichols, of the Linnæan Society of New York; Dr. T. S. Palmer of the U. S. Biological Survey, Washington, D. C., Prof. Robert T. Young of the University of North Dakota, a former active member of the Club; and several of the local members.

The 'D. V. O. C.' represents a type of organization which does much to advance the interests of bird study. Organized in 1890 by seven young

men interested in recording bird migration data, it has aimed to recruit its members so far as possible from those of high school and college age and to encourage the active participation of young men in all its work. Its field has been broad and discussion on any phase of ornithology is welcome, while the spirit of good fellowship which has always characterized its meetings has been carefully preserved.

Twenty-five years make great changes in the development of the members of any organization, and gathered around the anniversary table on January 7 might be seen doctors and lawyers of eminence, college professors, men high up in business corporations, and officers of banks and trust companies, mingled with the younger members who go to make up the bone and sinews of the Club today — all preserving their interest in bird study, ready to advance it in any way, and no doubt better for the existence of the 'D. V. O. C.'

A REVIEW of Joseph Grinnell's 'Mammals and Birds of the Lower Colorado Valley,' by Francis B. Sumner which appears in 'Science' for January 8, 1915, should be read by all who are interested in zoögeography, both for the interesting discussion of some of the points raised in the paper, and as an illustration of how far apart the systematists and experimental biologists stand in their consideration of evolutionary problems.

Prof. Sumner it should be said is much more lenient to the systematist than many of those who approach the subject from his point of view and who, as some one has put it, look upon systematic work as a disease, like the measles, from which everyone suffers at some time or other but from which one is expected to recover rapidly. Nevertheless some of his statements will doubtless astonish readers of 'The Auk' who have been brought up on zoögeography. For instance he says: "It would seem *a priori* that in traveling along a uniform gradient from a region of higher to one of lower average temperature or vice-versa, one would continually pass into and out of the ranges of species which found their limits of physiological adaptability at different points along the line. One would scarcely expect to encounter critical points, where the fauna and flora as a whole, or at least the most characteristic members of it, were suddenly replaced by quite a different assemblage. Yet this is the essence of the 'life-zone' conception.

"It would be foolhardy, indeed, for a zoölogist of limited field experience to criticize this conception. It is doubtless based upon extensive and accurate observations and represents real facts. But unfortunately they are, in a high degree, facts which, by their very nature, are scarcely communicable to most biologists. Before the life-zone conception can be of much service to the average student of evolutionary problems it will have to be expressed in terms which he is able to comprehend without making extended explorations, under the personal escort of one of the initiated. Until then such expressions as 'Upper Sonoran,' 'Transition' and the like will be to him mere empty names, or at best, they will recall to his mind certain colored areas, on a map of North America, the boundaries of which seem to have been chosen quite arbitrarily."

The "average student of evolutionary problems" is not a very definite term but it would seem that many systematists might be included in this category and were one of them to pick up a current work on Mendelism we think he might readily be pardoned if he made a similar plea for the "personal escort of one of the initiated."

The fact of the matter is that the two classes of investigators know too little of the work of one another. The majority of our biological schools are so thoroughly under the influence of the experimental biologists that students are trained and graduated with little or no conception of zoögeography or of the true nature of systematic research. The museums, on the other hand, foster the development of systematic workers, who are not inclined to consider seriously experiments based upon artificial domestic strains of animals, the origin of which may be unknown, or to admit that results so obtained have much to do with the evolution of natural species, which usually do not give similar results when used for experiment.

Careless work has been done on both sides but this does not discredit the vast amount of valuable contributions that each has made to the general problem of evolution. Systematic and zoögeographic research will not get to the bottom of the problem, unaided; neither will it be solved solely in terms of "zygotes" or "gametes."

Systematic nomenclature has also been a target for the experimental biologists, who are exasperated at the variety of names for the same species, or genus, and who fail to see the need of complicated rules of nomenclature. They are, however, threatened with precisely the same trouble and will have to take refuge in the same remedy. The terminology of Cytology, for example, is becoming so burdened with names, nearly or quite synonymous, that they are bewildering even to those fairly well "initiated."

Mr. Samuel N. Rhoads accompanied by Mr. Earl L. Poole, both of the Delaware Valley Ornithological Club, left early in January for several months' collecting in Guatemala.

As we go to press we learn of the final arrangements for the A. O. U. Meeting in San Francisco, May 18–20, 1915, and once again urge all members, both on the Pacific coast and in the country to the eastward, to make every effort to be present.

The eastern contingent will leave New York on May 6 reaching San Francisco on the evening of May 15. Two days, May 10–11, will be spent at the Grand Cañon, and two days and a half at Los Angeles.

From the San Francisco Committee of the A. O. U. and Cooper Club comes word that the sessions will be held at The Inside Inn, within the Exposition Grounds, with the annual dinner on the evening of the 18th. Friday the 21st will be devoted to a trip to the Farallon Islands, on the U. S. Fisheries steamer 'Albatross,' and other trips will be arranged in accordance with the number of visitors and their inclinations.

From Los Angeles, Mr. J. E. Law, Chairman of the Entertainment Committee of the Southern Division of the Cooper Club, writes that arrangements will be made to escort the eastern visitors to the Santa Barbara Islands, Mt. Lowe, or other points of interest during their stop in that city.

The splendid program that is thus offered and the cordial hospitality of the California ornithologists should be sufficient inducement to cause every member in the east or middle west who can possibly arrange to do so, to join the A. O. U. party and communicate as soon as possible with Mr. John H. Sage, Portland, Conn.

BUTLER'S OWL *Strix butleri* (*Hume*)